

Understanding the Divergent Recoveries of Protected Areas in Post-Conflict Mozambique

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Abstract

Mozambique is uniquely situated for success as an ecotourism destination, due to its potential for charismatic wildlife, its spectacular coastline, and its location between established safari hotspots. Yet Mozambique's conservation areas are largely underperforming. Animal populations have declined, and most parks receive fewer than 1000 tourists per year. Drawing from 35 interviews with diverse stakeholders in and around seven protected areas, this paper seeks to understand why the country's parks have experienced divergent outcomes since the end of the civil war in 1992. Because the conflict flattened the state's institutions, context-based factors and international interventions, rather than government institutions, have played an outsized role in determining parks' successes. Parks with agreeable contexts and parks that have been able to acquire the support of international actors and retain human talent have succeeded, while those in challenging contexts and those reliant on state management have failed. Future research should create a framework systematizing successful interventions in post-conflict conservation environments.

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Introduction

Mozambique is on the road to recovery a quarter century after the conclusion of its destructive civil war. While Mozambique remains one of the world's ten poorest countries, it has become more stable, prosperous, and healthy since the signing of the Rome Accords in 1992.¹ Travelers have again begun to take note of Mozambique's natural beauty and other assets; tourist arrivals have increased from 323,000 in 2001 to over 1,500,000 in 2015.² Ecosystems have tended to recover slowly, however, and outcomes have been highly divergent across the country's protected areas. With a few exceptions, hunting during and just after the civil war eradicated the country's wildlife, one of the key drivers of tourism during the colonial period. While parks like Gorongosa and Maputo Special Reserve have seen both game populations and revenues increase, others like Banhine and Zinave remain largely empty landscapes, devoid of tourists and large animals. Still others, like Limpopo which borders South Africa's famous Kruger National Park have become hotbeds of international elephant and rhino poaching. Kruger maintains the largest population of rhinoceros in the world; Limpopo lost its last rhino to poaching in 2013.³ In this paper, I will attempt to understand why Mozambique's national parks have experienced divergent recoveries since the end of its civil war in 1992. To do so, I will initially try to answer three other questions. First, to what extent has each of Mozambique's parks recovered in the post-conflict period? Second, does the history of war make post-conflict conservation different from standard conservation, and (third) if so how? From my analysis, I will attempt to distill principles of post-conflict conservation, which I hope will be helpful in guiding effective and equitable conservation efforts in Mozambique and in other post-conflict countries around the world.

Mozambique's high biodiversity and the potential of its national parks to act as drivers of economic growth make Mozambican conservation relevant both to conservationists focused on nature's intrinsic value and on its instrumental value to people (Tallis and Lubchenco 2014). Mozambique contains portions of three of Conservation International's 35 "biodiversity hotspots," ecoregions with unusually high biodiversity and high risk of destruction. The Maputaland-Pondoland-Albany hotspot covers Mozambique's south, the Coastal Forests of East Africa hotspot its coastline, and the Eastern Afro-Montane parts of its interior (Myers et al. 2000; Mittermeier et al. 2011). Although hotspots cover just 16% of the world's surface, they contain 75% of the world's endangered mammals, birds, and amphibians (Hanson et al. 2009). Moreover, all hotspots are highly threatened; to classify as one, a given ecoregion must have seen at least 70% of its original habitat destroyed. Conservationists oriented toward the intrinsic value of nature therefore consider biodiversity hotspots focal points for effective global biodiversity conservation. With three biodiversity hotspots, Mozambique is tied in possessing the greatest number of any country (Mittermeier et al. 2011). It should therefore be a focus of conservation strategies focused on preserving biodiversity.

¹ Data from the World Bank. See: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?year_high_desc=false

² Data from the World Bank. See: <https://data.worldbank.org/indicator/ST.INT.ARVL?locations=MZ>

³ See: <http://www.awf.org/news/mozambique-loses-last-surviving-rhinos-limpopo-national-park-continuing->

Moreover, understanding the relationship between war and conservation in Mozambique should be useful for global biodiversity conservation, due to the high overlap between conflict hotspots and biodiversity hotspots. 91% of major armed conflicts since the end of World War II have taken place at least partly within biodiversity hotspots, and 67% of hotspots have seen conflict over the same period. Conflict in Mozambique occurred in all three of the country's biodiversity hotspots (Hatton, Couto, and Oglethorpe 2001). The feedback loop linking ecosystem degradation to conflict may explain that overlap. Because hotspots have, by definition, lost over 70% of original habitat, ecosystems in them are often degraded, providing fewer ecosystem services (Dudley et al. 2002). By better understanding the relationship between war and conservation in Mozambique, then, we can draw conclusions applicable to the many states that have experienced war and biodiversity loss across the globe.

Conservation is also important to Mozambique due to the potential instrumental value of protected areas as drivers of growth and jobs. With a GDP per capita of just \$382, Mozambique is the second poorest country in Southern Africa (after Malawi) and the third or fourth poorest country overall.⁴ It is also one of the only countries in the region without a lucrative safari tourism industry. National parks in South Africa, Botswana, Zimbabwe, and Tanzania all drew visitors in the hundreds of thousands or millions in 2016.⁵ By contrast, Mozambique's most visited terrestrial protected area – Limpopo National Park – received just 15,436 visitors in 2014, despite abutting Kruger, Africa's most frequented protected area.⁶ Gorongosa National park, Mozambique's flagship protected area and the most visited park on the continent in the late colonial era, received just 1244 tourists in 2013.⁷ Mozambique's low baselines for both ecotourism and GDP per capita mean that growth in conservation sector revenues has the potential to contribute significantly to the country's economic growth and to tangibly raise standards of living.

Moreover, Mozambique's positioning between Africa's two safari hubs and its relatively diverse land and seascapes, allow the country unique potential as an ecotourism destination. Mozambique lies directly between Africa's two hubs of safari tourism: the Botswana-South Africa-Namibia-Zimbabwe hub is to its southwest, and the Tanzania-Kenya-Rwanda hub is to its North. Tourists traveling to other destinations in the region could therefore easily incorporate Mozambique into their itineraries. Mozambique also possesses one of the most appealing and accessible coastlines in Africa, with healthy coral reefs, abundant charismatic megafauna (manta rays, whale sharks, and dolphins are all easily viewable), and clean white-sand beaches. Mozambique could therefore be one of Africa's premier bush-to-beach tourist destinations. Finally, the landscapes of Mozambique's parks are greener and more forested than the region's other protected areas, due to Mozambique's relatively high rainfall. Green parks allow for lots of wildlife; before the civil war, Gorongosa and Zinave likely supported the densest concentrations of mammals in Africa (Tinley 2011). Mozambique can therefore use its unique landscapes and coastline to differentiate itself from its neighbors and draw tourists to its parks.

⁴ Data from the World Bank. See: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?year_high_desc=false

⁵ Data from the UNWTO. See: <https://www.e-unwto.org/action/doSearch?ConceptID=1061&target=topic&>

⁶ Data from Biofund. See: <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/>

⁷ Contemporary tourist arrivals from Biofund: <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/> Historical claim from Gorongosa.org: <http://www.gorongosa.org/our-story/timeline>

Finally, safari tourism has the potential to support the poorest communities in Mozambique (some of the poorest communities on Earth) by naturally distributing revenue to the remote rural areas of the country. Mozambique's national parks tend to be located in remote, sparsely populated rural regions of the country, away from the major cities that drive economic growth. Mozambican law requires that 20% of each park's revenues be distributed to rural communities surrounding protected areas. Any conservation policy will create winners and losers, as some groups benefit from the law enforcement and tourism jobs created by a park and others suffer when governments circumscribe access to natural resources to preserve biodiversity (Igoe et al). In an equitably designed conservation program that engages with local communities, though, the benefit of jobs to traditionally marginalized rural groups surrounding protected areas can far outweigh the costs. Thus, just as its high biodiversity means that Mozambique matters for conservation, the potential contribution of ecotourism to some of the world's poorest rural communities means that conservation matters for Mozambique as well. By better understanding why some parks recover while others fail, stakeholders can move toward practical principles of post-conflict conservation, that will help Mozambican parks both drive growth and jobs and protect the country's biodiversity.

Literature Review

In 2008, Machlis and Hanson outlined the field of Warfare Ecology, which attempts to consolidate previously fragmented research on the topic by examining the ecological implications of war through coupled biophysical and socioeconomic lenses (Machlis and Hanson 2008). Studies in this new and quickly growing field have largely focused on the ecological and social implications of conflict on protected areas during and just after the conflict period. In addition to these dynamic analyses of park development during the conflict period, frameworks exist to evaluate static protected area effectiveness. These frameworks, most of which were designed by NGOs can be applied to parks before, during, or after a conflict to evaluate efficacy at a given point in time.

Few studies have attempted to explain post-conflict protected area dynamics over a period of time, in the way that Warfare Ecology attempts to explain in-conflict protected area dynamics. While Machlis and Hanson have called for research devising methods for "improved rehabilitation of postwar ecosystem services," researchers have largely not yet investigated why some parks recover quickly post-conflict, and why others fail to do so. This study, then, attempts to fill that temporal gap in the post-conflict conservation literature. It explores the factors that shape park trajectories in the post-conflict period, that critical stage taking place after states have left the conflict period – the realm of warfare ecology – but before they have reached institutional stability – the realm of traditional conservation literature.

Previous studies investigating the relationship between conflict and conservation reveal modern warfare's overwhelmingly destructive impact on wildlife and protected areas (Hatton, Couto, and Oglethorpe 2001; Glew and Hudson 2007; Jacobs and Schloeder 2001). While nineteenth-century wars often provided ecosystems respite from exploitation, changing patterns of warfare in the twentieth century – particularly the spread of insurgencies and use of chemical defoliants – mean modern wars generally harm the environment (Dudley et al. 2002). Because wars degrade

the ecosystems in which they take place, they cause natural resources to become scarce, creating a positive feedback loop that makes future conflict more likely (Dudley et al. 2002). All conflicts do not affect ecosystems equivalently, however. To address these differences, Machlis and Hanson devised a taxonomy to predict the environmental effects of conflict by categorizing warfare by field and scale (Machlis and Hanson 2008). Their framework builds upon Lanier-Graham's system, which divides the environmental impacts of conflict into three categories: direct impacts, indirect impacts, and conflict-induced impacts (Lanier-Graham 1993). According to a 2007 study, 87% of the war impacts on conservation areas were indirect, and parks often felt impacts most severely in the anarchical period between the cessation of hostilities and the reinstatement of state control (Glew and Hudson 2007).

In addition to the academic literature demonstrating the effects of conflict on wildlife and habitat, conservation NGOs have developed detailed frameworks for evaluating protected areas at a given point in time. IUCN's World Commission on Protected Areas has put forth a series of papers on "Best Practice Protected Area Guidelines," including "Evaluating Effectiveness: A Framework for Assessing the Management of Protected Areas" (IUCN). The World Wildlife Fund's "Rapid Assessment and Prioritization of Protected Area Management" (RAPPAM) methodology, meanwhile, provides governments and NGOs with a fast and easily executable assessment framework.

None of these frameworks has yet been used to comprehensively evaluate Mozambique's system of protected areas, however, and even single-park evaluations have been sporadic, perhaps due to the limited research capacity within Mozambique, the difficulty of traveling to many of Mozambique's parks, and the relative lack of Portuguese-speakers. Kenneth Tinley's landmark 1965 "Framework of the Gorongosa Ecosystem" may be the only comprehensive image of a Mozambican park in the pre-conflict era (Tinley 1965). Hatton et al.'s "Biodiversity and War: A Case Study of Mozambique" broadly summarizes the devastation wrought by conflict and post-conflict anarchy on Mozambique's wildlife and protected areas, and provides a general snapshot of their statuses in 2001 (Hatton, Couto, and Oglethorpe 2001). Biofund uses the Management Effectiveness Tracking Tool (METT) – designed by the World Bank and WWF – to monitor the management effectiveness of protected areas in country. METT examines management effectiveness in broad strokes, providing an assessment based on a scorecard questionnaire with questions in six categories: context, planning, inputs, process, outputs and outcomes. Finally, researchers have executed consistent aerial surveys to monitor wildlife populations in Gorongosa since 2007, and sporadic surveys to monitor populations in some of Mozambique's other parks (Stalmans, Peel, and Massad 2014).

The studies that have looked at Mozambican conservation in the post-conflict era have tended to look at the effect of a single variable on a single park. They can largely be grouped into three categories. First, researchers have looked at the effects of transfrontier conservation initiatives on Mozambican protected areas. Studies investigating the effect of South African institutions on Limpopo National park fall into this category (Mabunda et al. 2012; Hulme and Murphree 2001; Smith et al. 2008). Second, researchers have looked at the impacts of community conservation initiatives on Mozambican protected areas. Anstey's analysis of the political economy of community conservation in Mozambique falls into this category, as do analyses of discrete community conservation programs in Chimanimani and Tchuma Tchato (Anstey 2001; Filimão,

Mansur, and Namanha 1999; Anstey and de Sousa 2001). Schuerholz and Baldus's investigation of Community-based Wildlife Management in the Selous-Niassa transfrontier area fall into both of the aforementioned literature categories (Schuerholz and Baldus 2007).

Third, researchers have conducted wide-ranging studies in Gorongosa, Mozambique's flagship national park, which is home to the E.O. Wilson Biodiversity Lab and is well-funded by the Gorongosa Restoration Project (previously, the Carr Foundation). On the social science side, Diallo has asserted that Gorongosa's history as the headquarters of RENAMO made the government more willing there than in other protected areas to cede authority to international organizations capable of fulfilling the role of the state (Diallo 2015). On the conservation side, Pringle looked at Gorongosa as an example of a successful "upgrading" of a protected area (Pringle 2017). Finally, Pritchard studied the employment of former combatants as Gorongosa park rangers as a mechanism of post-conflict peacebuilding (Pritchard 2015).

These three focus areas have left parks without transfrontier status, community conservation initiatives, or Gorongosa's international fame largely understudied. Moreover, the focus on transfrontier and community conservation initiatives has left analysis of other factors influencing Mozambican conservation outcomes – such as ranger-warden dynamics, park financing strategies, and geographic location – largely absent from the academic literature. No previous study has compared multiple factors shaping post-conflict park outcomes across multiple protected areas in Mozambique.

The relative lack of research on Mozambican conservation areas speaks to a broader spatial literature gap in African conservation. African conservation literature has focused overwhelmingly on Anglophone and to a lesser extent Francophone Africa, with most studies taking place in internationally famous parks like Serengeti, Amboseli, Kruger, and Virunga. Very few studies have looked at conservation in Lusophone Africa, despite the distinctness of the Portuguese approach to colonization. By examining post-conflict conservation in Mozambique, then, this paper attempts not only to help bridge the temporal post-conflict literature gap, but also the spatial Lusophone Africa gap.

Methodology

To answer my three research questions – (1) how is post-conflict park management different from standard park management; (2) to what extent has each of Mozambique's parks recovered; and (3) why have Mozambique's parks experienced divergent recoveries post-conflict – I drew data from academic literature on warfare ecology and Southern African conservation, from NGO-produced "grey literature" reports on Mozambican parks, and from 35 stakeholder interviews conducted in Mozambique and South Africa. Interviews were associated with one of eight Mozambican parks or had broad experience in Mozambican conservation. I selected interview subjects based on relevance and accessibility, using a snowball interview method in which my initial subjects advised me on whom I should contact next. I interviewed 15 conservationists, 7 law enforcement officials including 4 park wardens, 4 tourism officials, 3 scientists and academics, and 2 local community members. I paid special attention to including both international stakeholders (16 total) and Mozambican stakeholders (19 total) in my

interviews, in order to avoid falling into the narrative that paints international conservationists wholly as “white saviors” and to avoid falling into the narrative that paints international conservationists wholly as “white land-grabbers.” The truth, of course is far more complicated than a single narrative can portray. I used a semi-structured interview format, in which I let the subject guide the conversation within boundaries.

To answer my first question – how does management of parks in a post-conflict environment differ from the management of parks in a peace time environment? – I reviewed literature on the effects of conflict on protected areas and interviewed conservation practitioners who have operated in both post-conflict and non-post-conflict countries. Of the 35 total interviews I conducted, 7 included comparisons of post-conflict conservation practices and standard African conservation practices. Those included interviews with leadership in international conservation organizations, senior Mozambican government officials, and major players in the private sector hunting community. I supplemented those interviews with reviews of literature on warfare ecology and on development of non-post-conflict conservation systems, especially Zambia’s (Gibson 1999, 2000). By comparing the development of post-conflict conservation systems with non-post-conflict systems such as Zambia’s, I attempted to tease out the factors that make post-conflict conservation distinct.

To answer my second question – to what extent has each park I analyze recovered? – I had to have a sense of the status of each park at the end of the civil war in 1992, and of each park now. I define park success in terms of both ecology and economics. Ecologically, a well-functioning park will maintain a diverse and healthy population of game. To determine post-war and current game populations, I use a combination of aerial surveys and interviews with conservationists, park officials, and private sector hunters working in and around parks in the post-war period, and my own field notes from time spent driving with rangers or conservationists through each park. Aerial surveys can be inaccurate, as they depend heavily on the efficacy of the method design used in a given survey. Whenever possible, then, I corroborated surveys with information from interviews and from my own observations. I believe that taken together alongside data from interviews, the aerial surveys provide a reasonable approximation of wildlife populations, despite their weaknesses.

To be successful from a socio-economic perspective, a well-functioning park must generate revenue. Ideally, I would add to the definition of socioeconomic success the generation of meaningful benefits to local communities surrounding parks, to ensure that success includes a measure of equity. However, limited time and access to translators of local languages constrained my ability to interview local community members. Thus, I use revenue generation as a proxy for the possibility of benefit to local communities. Mozambican law requires at least 20% of park revenues be distributed to local communities, so any revenues will, barring corruption, be of at least some benefit to those communities. And while any park will unequally distribute benefits and costs to its stakeholders (Brockington, Duffy, and Igoe 2008), the generation of tourist revenues at least makes possible the distribution of benefits to local community members. The extent to which those revenues reach communities in Mozambique would be a good subject of future research.

To answer my third question – why have Mozambican parks experienced divergent recoveries? – I drew from 35 stakeholder interviews conducted in Mozambique and South Africa, and from field notes recorded after shadowing rangers and tourism operators in seven Mozambican protected areas. I initially structured interviews around three hypotheses – that money, state capacity, and/or community relations determine park recoveries. However, after speaking with stakeholders, I expanded my research questions to encompass issues of management strategy, management priorities, threat level, geography, transfrontier status, and human population density. After translating and transcribing interviews, I analyzed transcripts to draw forth themes.

Findings and Analysis I: Evaluation of Selected Mozambican Parks

Analytical Framework

Before we can investigate the factors driving parks' recoveries, we must understand the extent to which each of Mozambique's parks has recovered. In this section, I evaluate the post-conflict recoveries of selected Mozambican protected areas. I begin by outlining the framework I use to gauge each park's recovery. Then, I provide my rationale for selecting the six parks I have chosen to analyze. In brief, I was able to visit or interview people who have worked in each of these protected areas, and all six were similarly devastated by the conflict. Finally, I will describe and evaluate the recoveries of these six core protected areas: Gorongosa, Limpopo, Zinave and Banhine National Parks, Maputo Special Reserve, and Marromeu National Reserve.⁸

I will describe more briefly the experiences of two more protected areas that I visited but the recoveries of which I am not able to analyze: Mágoè National Park and Bazaruto National Park. Mágoè was not directly affected by the war, and therefore cannot be analyzed in terms of a post-conflict recovery. It did, however, experience the same absence of government institutions during the conflict and post-conflict periods. It is therefore useful to examine as a control. Bazaruto National Park, meanwhile, is predominantly a Marine Protected Area, and therefore exists under a different set of rules. I nevertheless believe it is useful to examine Bazaruto in some depth, as there are interesting parallels between its history and the histories of its terrestrial counterparts.

I will base the evaluation of each park's recovery on two factors: tourist arrivals as a proxy for socioeconomic recovery, and herbivore population size as a proxy for ecological recovery.⁹ Current tourist arrival data are sometimes unavailable, so I must draw from as far back as 2013. In the case of each park, I corroborate those numbers by speaking to conservation and law enforcement officials. Parks received between 0 and 16,000 visitors, with Marromeu National Reserve receiving the fewest at 0 visitors in 2013, and Limpopo National Park receiving the most at 15,436 visitors in 2014.¹⁰ To assess socioeconomic recovery, I categorize tourist arrivals into four buckets: no recovery (0-500 arrivals), minor recovery (500 - 5000 arrivals), substantial recovery (>5000 arrivals) and full recovery (sufficient arrivals to fully fund park operations). By

⁹ I outline the rationale for the selection of these factors in the methods section.

¹⁰ Biofund. <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/>

this standard, no terrestrial Mozambican park has approached achieving a full socioeconomic recovery.

I also categorize park's ecological recoveries into four buckets. In all six "core" parks, poaching in the conflict and post-conflict periods eliminated or nearly eliminated large herbivore populations. Each park, then, started from a similar position in the mid 1990s. In parks that are "in decline," the populations of most large herbivore species have shrunk since the immediate post-war period. In parks that have enjoyed "minor recoveries" the populations of most large herbivore species have expanded modestly since the immediate post-war period. Current large herbivore diversity in these parks is substantially lower than pre-war diversity and growth is still suppressed by poaching. Populations of most species number in the tens or hundreds, perhaps with a few species in the low thousands. Large areas of the park may be devoid of game. In parks that have experienced "substantial recoveries" the populations of most large herbivore species have expanded significantly since the immediate post-war period. Current large herbivore diversity is similar to or slightly below pre-war diversity. Populations of many species number in the thousands or even in the tens of thousands, and game exists throughout most of the park. Finally, in parks that have experienced "full recoveries," the populations of most large herbivores have reached or surpassed pre-war numbers. While the dominant herbivore species composition may have changed, the total herbivore biomass is similar to the pre-war figure. Populations of many species number in the thousands or tens of thousands, and even populations of rarer species number in the hundreds.

In addition to evaluating parks' economic and ecological recoveries, I cross-check my assessments of each park's ecological and socioeconomic recoveries with its score according to the Management Effectiveness Track Tool (METT). Developed by World Wildlife Fund and the World Bank, METT is used to evaluate different components of the protected area management cycle in order to monitor the effectiveness of protected area management. METT assessments in Mozambique were carried out in 2013 by Biofund in all six parks in my core analysis, plus Mágoè National Park.¹¹ METT evaluations certainly should not be used alone, as they miss core principles of park effectiveness such as a park's relationship with surrounding communities. I think they can be helpful, however, when interpreted alongside other measures of park effectiveness.

I was not able to visit all of Mozambique's protected areas, due to limited time, funding, and access. Consequently, my analysis – like all other analyses of Mozambique's protected areas to date – is incomplete. I selected parks based on three criteria: war impact, prominence, and accessibility. In all six of the protected areas that constitute the core of my analysis, both large mammal populations and tourist infrastructure (if infrastructure existed before the war) were nearly eliminated. These six protected areas are also all National Parks or National/Special Reserves, which form the core of Mozambique's public conservation estate.¹² National Parks and National/Special Reserves receive more funding and publicity than forest reserves and

¹¹ METT evaluations can be found at Biofund's website. <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/>

¹² National Parks and National/Special Preserves are managed identically, except that preserves allow human habitation (but not use), and parks do not. Ironically, the only protected area in Mozambique without inhabitants is Gilé National Preserve; people live inside every one of the country's national parks.

community conservation areas, the other major types of public protected area in Mozambique. All National Parks and National/Special Reserves have a warden and rangers. Forest reserves operate as complete paper parks with no oversight at all, and exist mainly to meet conservation land targets. Finally, I selected parks based on my ability to visit them, as in the cases of Gorongosa, Limpopo, MSR, Zinave, Mágoè, and Bazaruto, or to speak with stakeholders familiar with them, as in the cases of Marromeu and Banhine.

This list of eight parks leaves notable exceptions, including the Chimanimani National Reserve and the three major terrestrial parks that exist north of the Zambezi: Gilé National Reserve, Niassa National Reserve, and Quirimbas National Park. Unfortunately, time and funding prevented me from visiting those parks, and I was unable to find enough stakeholders with knowledge of them to gain a well-rounded understanding of their recoveries.

Table 1: Evaluation of Mozambican Parks

Table 1. Mozambican parks have experienced divergent post-conflict ecological and socio-economic recoveries, as measured by the recoveries of large herbivore populations and of tourist arrivals. Numbers for tourist arrivals are from 2013, 2014, or 2017, the most recent years for which I could find data. METT scores are on a scale from 0 to 100, with 0 indicating no management and 100 indicating perfect management according to the imperfect scale developed by the World Wildlife Fund and the World Bank. Data for number of park employees and rangers come from Biofund.

Park	Tourist Arrivals	Economic Recovery	Ecological Recovery	Employees (Rangers)	METT
Banhine National Park	10 (2014)	None	Minor	36	39
Gorongosa National Park	5790 (2017)	Substantial	Full	582 (228)	62
Limpopo National Park	15,436 (2014)	Substantial	Minor	210 (74)	53
Maputo Special Reserve	5,429 (2014)	Substantial	Minor	56 (25)	55
Marromeu National Reserve	0 (2013)	None	Substantial	9 (8)	30
Zinave National Park	58 (2013)	None	Minor	52 (45)	41

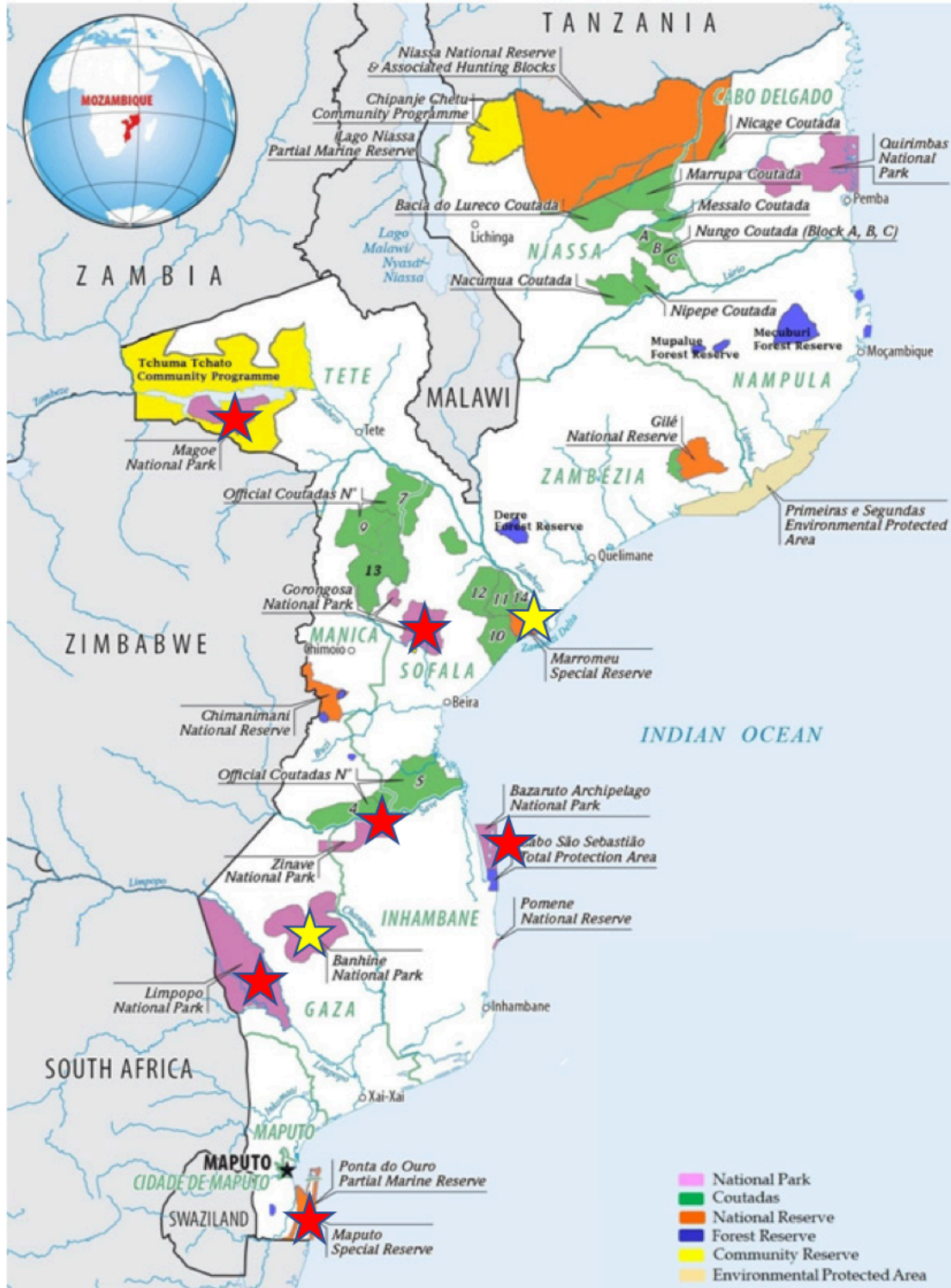


Figure 1. Map of Mozambican protected areas with the six parks I visited represented by red stars, and the two parks I evaluated without visiting represented by yellow stars. The map was created by Biofund. See: <http://www.biofund.org.mz/en/mozambique/conservation-areas-of-mozambique/>

Banhine National Park

Banhine National Parks was established by the Portuguese Colonial Government just before independence in 1973, to protect a large seasonal wetland and important flocks of ostrich.¹³ Management before the war was limited to law enforcement (Interview 21). Banhine received almost no tourists in the pre-war period, but supported abundant wildlife (Diploma Legislativo 22/73). Subsistence poaching during the civil war devastated wildlife in the park, although small populations of most species were present in the first post-war aerial survey in 2004 (Stalmans 2004).

The African Wildlife Foundation invested in community outreach, infrastructure, and conservation activities in Banhine from 2004 to 2012, before ceasing operations due to lack of donor interest (Interview 31). However, studies undertaken by the African Wildlife Foundation played a role in convincing the Mozambican government to alter the park's limits in 2013. The new borders excluded communities formerly inside the park from its bounds, as well as key portions of Banhine's wetland (Diploma Legislativo 104-1078). The conservationists I spoke to were unsure as to why the new boundaries excluded the wetland areas formerly in the park.

Banhine has experienced a minor ecological recovery. Wildlife numbers have begun to grow, although most populations are small, numbering in the tens or hundreds (Aerial Survey 2012). Banhine is geographically close to Kruger and Gonarezhou National Parks in South Africa and Zimbabwe respectively, so animals from those parks may have helped to replenish Banhine's populations. Key species, including zebra, giraffe, and wildebeest remain absent. Banhine still supports small populations of lion and cheetah, and is home to the only packs of African wild dog in central or southern Mozambique (Andresen, Everatt, and Kerley 2015).

Banhine has experienced no economic recovery. The park is very remote; driving to it takes two days from the nearest cities, Maputo and Vilankulos. Tourist infrastructure within the park is limited to a few unmaintained tents. Consequently, Banhine receives very few tourists; in 2013, the park received just 10 visitors and generated \$500 in revenue.¹⁴

Gorongosa National Park

The Portuguese Colonial Government established Gorongosa as a hunting reserve in 1920, and upgraded it to a national park in 1960. The park protects a floodplain to the south of Mount Gorongosa, at the southern end of the African Rift Valley. The park was nicknamed "the place where Noah left his Ark," in the colonial period due to its incredible concentrations of wildlife. It was particularly famous for its huge herds of buffalo, which numbered in the tens of thousands and its lions, which numbered around six hundred. (Tinley 2011). Gorongosa was the only park in Mozambique with well-developed tourist infrastructure before the civil war. It hosted thousands of wealthy guests including astronauts and movie stars (Interview 21).¹⁵

¹³ See: <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/#area-banhine>

¹⁴ *Ibid.*

¹⁵ See also Gorongosa Website. <http://www.gorongosa.org/>

The civil war devastated Gorongosa. Mount Gorongosa served as Renamo's most important base, and the park experienced some of the heaviest fighting in the country. Renamo soldiers hunted Gorongosa's animals for meat and ivory, which helped finance Renamo throughout the war (Interview 21). Between 1972 and a post-war aerial survey in 2001 the population of almost every species plummeted. Cape buffalo in the park decreased from thirteen thousand to fifteen, wildebeest from sixty-four hundred to one, hippos from thirty-five hundred to forty-four, zebras from thirty-five hundred to twelve (Tinley 2011; Dunham 2004; Gourevitch 2009). After arriving in 2001, Roberto Zolho, the park's warden, did not see buffalo, wildebeest, hippo, or sable for two years (Interview with Roberto Zolho). The fighting completely destroyed the park's tourist infrastructure as well (Interview 21).¹⁶

From 1994 to 1999, the African Development Bank and the European Union invested USD \$5 million in Gorongosa to restore law enforcement, but achieved little success in restoring wildlife populations and tourism. The philanthropist Greg Carr visited the park in 2004, and signed a comanagement agreement with the Mozambican government in 2008. Since his arrival, the Carr Foundation (renamed the Gorongosa Restoration Project) has invested over \$20 million in the park's recovery. Gorongosa now employs 582 staff including 228 rangers, the largest ranger force in Mozambique.

Since Carr's arrival in 2008, Gorongosa has experienced a full ecological recovery. Populations of every large mammal in the park except zebra have experienced major recoveries, with many species numbering in the high hundreds, thousands, and even ten thousands. The park's central floodplain supports 10,000 reedbuck and 45,000 waterbuck, likely the largest populations in Africa (Stalmans and Peel 2016). The composition of dominant species in the park is different now than in the pre-war period, with waterbuck and reedbuck dominating in place of buffalo and elephant, although buffalo and elephant populations continue to rise. Biomass in the park, however, has recovered to 8027 kg per km², which equates to the conservative carrying capacity for biomass in the park of 8000 kg per km² (Stalmans and Peel 2016). Most species' recoveries occurred naturally, with only small populations of elephants, hippos, zebras, wildebeest, buffalo, and eland introduced from other parks. One interview subject suggested that migration from Marromeu National Reserve and surrounding hunting areas to the east of the park helped replenish wildlife populations, especially lions, of which about 80 now exist in the park (Interview 26).

Tourist arrivals in Gorongosa recovered substantially through the mid-2000s, before declining from 2013 to 2016 due to a period of regional instability (Interview 9). As of 2017, tourist arrivals have increased once again to about 5700 visitors, generating \$282,840 in income. Moreover, construction has begun on a new high-end tourism camp, to open in June 2018 (Mutemba 2017). Thus, while the economic recovery of Gorongosa has been inconsistent and dependent on external political factors, the economic future of the park appears bright.

Limpopo National Park

¹⁶ See also Gorongosa website: <http://www.gorongosa.org/>

The present area of Limpopo National Park was initially gazetted as a hunting concession or “coutada” in 1961 (**Cria a Coutada No 16, Plano do Maneio do Parque Nacional Limpopo**). The Mozambican government upgraded the hunting reserve to a national park in 2001, as part of the creation of the Great Limpopo Transfrontier Park, which consists of Mozambique’s Limpopo National Park, South Africa’s Kruger National Park, and Zimbabwe’s Gonarezhou National Park. Its creation was spearheaded by the Peace Park Foundation and by South African president Nelson Mandela and Mozambican president Joaquim Chissano (**Decreto No 39/2001**; Interview 14). Since 2001, the Peace Parks Foundation has operated in the park in the capacity of technical advisor, supporting law enforcement and management activities. The Peace Parks Foundation also operated a fenced-in sanctuary within the park in an effort to securely reintroduce wildlife, although most of the reintroduced animals were poached after the sanctuary was opened (Interview 14).

The civil war and associated subsistence hunting almost eliminated Limpopo’s game. The park lies on the border with South Africa, so apartheid South African military forces likely operated within its borders during the war. Moreover, thousands of refugees traveling through the park to reach South Africa likely hunted and consumed much of the park’s wildlife (Interview 11). The first aerial survey in the park counted just 26 kudu and 5 ostriches total, suggesting that wildlife in the park was almost completely eliminated (Interview 14).

Evidence from aerial surveys and conversations with conservationists suggests that while populations of game have experienced a minor recovery since the end of the conflict in 1992, they remain far below carrying capacity. This is despite partially open borders with Kruger, which is home to one of the largest populations of game in Africa. Comparing present-day populations of large herbivores in Limpopo and bordering Kruger, which is twice the size of Limpopo and which shares a partly open border with the park, illuminates the scale of wildlife loss. Kruger supports 13,750 elephants, 37,100 buffalo, 6,800 – 10,300 giraffe, and 6,000 – 8,000 white rhino (Sanparks.org). Limpopo currently supports just 600 elephants, 940 buffalo, 45 giraffe, and 5 white rhino (Limpopo 2013 Aerial Survey). There are probably about 10,000 animals in Limpopo, according to a conservationist familiar with the park (Interview 14). The most recent aerial survey estimates that no population of herbivores in Limpopo numbered more than 1000 individuals, although a conservationist familiar with the park estimated that there are 3000 impala and 1500 buffalo within its bounds (Interview 14). Anecdotal evidence from a tourism worker familiar with the park suggests that while most game populations increased modestly over the past 4 years, game had become less visible as of July 2017, perhaps due to an uptick in poaching pressure.

Limpopo received 15,436 tourists in 2014, the highest of any park in Mozambique.¹⁷ Most tourists, however, pass through park while driving from South Africa to Mozambique’s beaches, and do not remain in the park overnight. Nevertheless, their entrance fees generate substantial revenue, raising \$68,491 in 2014.¹⁸

¹⁷ Data from Biofund.

¹⁸ *Ibid.*

Maputo Special Reserve

The Portuguese Colonial government gazetted present-day Maputo Special Reserve (MSR) as an elephant reserve in 1960, to protect the region's elephants (**Legislação 1969: 1/32**). Two conservationists with a long history of work in Mozambique told me that the reserve hosted many South African and Swazi tourists before independence, although I did not see evidence of colonial-era tourist infrastructure on visiting the park (Interviews 17, 20). The borders of the reserve were maintained upon Mozambique's independence in 1975. The country's first president, Samora Machel, supported a controversial effort to relocate the reserve's inhabitants from 1976 - 1978. However, most inhabitants returned to the reserve during the conflict period (Interview 21).

The restoration of MSR began in earnest in 2002, with the creation of the Lubombo Transfrontier Conservation Area, spearheaded by the Peace Parks Foundation. The transfrontier conservation area is composed of 8 protected areas in Mozambique, South Africa, and Swaziland, but integration remains largely theoretical.¹⁹ Two of those protected areas, however, are of importance to MSR (Interviews 14,15). First, Mozambique's Ponta D'Ouro Marine Reserve protects the coastal waters and coral reefs just off the reserve's spectacular coast. Second, South Africa's Tembe Elephant Reserve has shared a fenced border with MSR, since the addition of the 240 km² Futi Corridor to the reserve in 2011. The park's reconstructed headquarters, financed by a loan from the World Bank and by support from the Peace Parks Foundation, reopened in 2014.

Populations of every large herbivore in MSR declined during the civil war. The 1995 aerial survey counted fewer than 50 individuals of every species in the park except for elephants. The park's elephant population fell from approximately 350 in 1970 to 120 in 1995 and to 70 in 2004, suggesting the poaching pressure remained high post-conflict. (2012 Aerial Survey). The proximity of MSR to Maputo and to the South African Border means the reserve likely experienced heavy fighting.

Maputo Special Reserve has experienced a minor ecological recovery since the end of the civil war. From 2010 to 2016, the Peace Parks Foundation facilitated the relocation of 1701 animals into the park (Peace Parks Foundation Website). The park currently supports approximately 3000 large herbivores and has an estimated carrying capacity of 20,000 (Interview 14). Most species' populations number in the hundreds. Only reedbuck number in the thousands, with an estimated population of 1212 in 2012. The reserve's elephant population has recovered to approximately 450, suggesting a full recovery to pre-conflict numbers for the reserve's signature species (Bodasing and Cumbane 2012). The war, however completely eliminated predators in the reserve; no lions, leopards or hyenas exist within its bounds (Interviews 16, 18).

Maputo Special Reserve has experienced a substantial economic recovery since the end of the conflict. The park received 5,429 tourists in 2014, generating USD \$59,800.²⁰ The presence of both big five wildlife (buffalo and elephant), and a spectacular coastline makes MSR uniquely appealing in Mozambique as a tourist destination. However, multiple conservationists familiar

¹⁹ See the Peace Parks Foundation's website: <http://www.peaceparks.org/>

²⁰ Data from Biofund

with the park mentioned that the absence of lions and leopards – and the government’s reticence about reintroducing predators due to fear of human-wildlife conflict – had the potential to depress tourist arrivals (Interviews 15, 19). Nevertheless, conservationists and government officials were optimistic about the economic potential of MSR. Multiple interview subjects with broad knowledge of Mozambique’s conservation estate predicted that MSR would become the first park in Mozambique to become economically self-sufficient, by attracting 40,000 tourists per year by 2025 (Interviews 12, 14, 19).

Marromeu National Reserve

The Portuguese colonial government established Marromeu National Reserve in 1960 to protect a population of 60,000 cape buffalo in the Zambezi Delta. The reserve forms part of the larger Marromeu Complex, a vast swampy protected area in the southern Zambezi which also includes 4 hunting concessions: coutadas 10, 11, 12 and 14. The Marromeu complex in turn forms part of a single interconnected super-ecosystem with Gorongosa, which stretches from Mount Gorongosa to the Zambezi River and the Indian Ocean (Tinley 2011). Before the civil war, Marromeu’s population of 60,000 cape buffalo was likely the largest in Africa (Beilfuss, Bento, and Haldane 2010).

The Marromeu-Gorongosa ecosystem was profoundly impacted by the civil war. Between 1980 and 1994, central Mozambique lost 120,000 animals, which is among the largest reported declines in modern warfare history, comparable to the 1979-1987 Ugandan Civil War (Beilfuss, Bento, and Haldane 2010). The first post-war aerial survey in 1994 reported only 3 species: cape buffalo, waterbuck, and reedbuck. The cape buffalo population declined by 95% to just 2400 individuals. Waterbuck, hippopotamus and zebra populations, observed in later aerial surveys, had declined by 98%. The Marromeu complex is difficult to access from land and by boat due to its swampy terrain and lack of open water. Moreover, it has only a very small resident population, so it is unlikely that local subsistence poaching contributed much to the enormous decline in wildlife (Interview 1). One tourism worker, who spent part of the conflict period in Mozambique, told me that a Soviet ship anchored off Marromeu during the war harvested tens of thousands of buffalo to feed Frelimo and Soviet troops (Interview 30). I was unable to verify this explanation. If true, however, it would elucidate an otherwise difficult to explain wildlife crash in one of Africa’s least accessible swamps.

Despite an almost complete lack of external support, and a ranger force composed of just 8 people, Marromeu has experienced a substantial ecological recovery (Beilfuss, Bento, and Haldane 2010). The 2010 aerial survey recorded 18,000 large herbivores in Marromeu, with most populations numbering in the hundreds or thousands. The survey counted 10,300 individual buffalo, approximately 33% of the pre-war population for the reserve.²¹ Other abundant species included waterbuck (4000), sable (2000), warthog (2500), and reedbuck (2500). Elephants have recovered to their pre-war population of about 350. Hippopotamus and zebra, however, remain far below pre-war population sizes at about 150 and 60 individuals each. Lions exist in the park, although in unknown numbers. Scientists have undertaken almost no research in Marromeu, so

²¹ The larger pre-war figure of 60,000 individuals included the buffalo in the adjacent coutadas, which were not covered by the 2010 aerial survey.

the reasons for this uneven recovery are unknown. Total current biomass remains below the pre-war biomass, as evidenced by the reduced population of buffalo, the reserve's dominant species. No aerial survey of Marromeu has been undertaken since 2010, but conservationists and tourism workers familiar with the reserve report that the population of buffalo in the complex has continued to grow to about 20,000 individuals as of 2017 (Interviews 1, 30).

Marromeu National Reserve has experienced no economic recovery, although it also received no tourists before the war. The reserve itself has no tourist infrastructure and is difficult to access by car in the dry season and impossible to access by car in the wet season. Marromeu received no tourists in 2013.²² There are currently no plans to increase tourism, and the reserve is not supported by any international conservation NGOs. That said, the hunting concessions encircling the reserve receive a low volume of high-paying hunting tourists (Interview 30).

Zinave National Park

The Portuguese colonial government gazetted Zinave as a hunting concession in 1962, before upgrading it to a national park in 1973 (*Diploma Legislativo 47/73*). The government established Zinave principally to protect giraffe, which only occur in Mozambique south of the Save River. During the civil war, the park saw heavy fighting as it sits on the border of Inhambane, a province traditionally loyal to Frelimo, and Sofala, a province traditionally loyal to Renamo. A conservationist with experience operating in wartime Mozambique told me that there was a covert Frelimo base just outside the park's headquarters in Covane at the beginning of the war (Interview 26). Frelimo soldiers hunted most of the park's wildlife for food, and pretty much eliminated the large herds in the first few years of the conflict. Multiple conservationists told me that just after the war, hunters from Inhambane and Vilankulos searching for food eliminated most of the other game by combing through the park at night with spotlights (Interviews 12, 25, 26).

The first rangers returned to Zinave in 1998, 6 years after the cessation of hostilities (Peace Parks Foundation 2010). In 2005, a World Bank program built a fenced wildlife sanctuary in Zinave and reintroduced 4 giraffes, 8 elephants and some antelope; however, mismanagement of water holes within the sanctuary, perhaps due to lack of human capacity after the end of the World Bank intervention, caused most of the antelope to die off (Interview 26). The program also built a community-operated lodge, but it never received any tourists, again perhaps due to lack of human capacity (Interview 26). In 2015, the Mozambican government signed a comanagement agreement with the Peace Parks Foundation (PPF). PPF has more autonomy under its comanagement role in Zinave, than under its technical advisory role in Limpopo and MSR. Since 2016, PPF has introduced 400 animals to the park's sanctuary, including impala, waterbuck, reedbuck, warthog, and elephant. The organization plans to reintroduce translocate 6000 animals to the park from Zimbabwe's Save Valley Conservancy, but bureaucratic problems have so far prevented the translocation's accomplishment.²³

²² Data from Biofund

²³ See Peace Parks Foundation Website: <http://www.peaceparks.org/>

It is impossible to tell whether wildlife populations in Zinave have experienced a minor recovery or a continued decline, as only one 2009 aerial survey has been undertaken of the park. It reported small populations of just six species of large herbivores: 899 common duiker, 150 impala, 235 kudu, 254 oribi, 143 nyala, and 88 hippopotamus (Dunham 2004). That represents a dramatic decline from pre-war wildlife populations; if populations have recovered they have not recovered much. Officials on the ground in Zinave corroborated the assessment of the aerial survey, telling me that while small nuclei of game exist in a few areas of the park, Zinave is mostly devoid of wildlife. The only concentrated populations of game are of the reintroduced species in the fenced-in sanctuary (Interviews 25, 26).

Tourism has not recovered. Zinave received just 58 visitors in 2014, generating \$600 in revenue (Biofund). PPF is currently constructing a high-end lodge in the park on the banks of the Save River. It is still too early to tell whether PPF's efforts to jump start the park's tourism industry with a major game translocation will be successful.

Other Parks

In addition to the six core protected areas mentioned above, I will briefly describe the statuses of the two other protected areas I visited: Mágoè National Park and Bazaruto National Park. I have chosen to describe these parks in less detail because they do not fit the requirements of the core parks of my analysis; Mágoè was not directly affected by the war, while Bazaruto is not a terrestrial protected area.

Mágoè National Park is Mozambique's newest formal protected area; it was established in 2013, at the behest of the governor of Tete who was concerned that his province did not have the prestige possessing a national park (Interview 28). Mágoè was formed out of one of the hunting coutadas that composed the Tchuma Tchato Community Conservation Area, a relatively successful complex of hunting concessions partnered with local communities that surrounds Lake Cahora Bassa. Mágoè was not directly affected by the war, due to its location between Lake Cahora Bassa and the Zimbabwe border; Renamo troops did not operate in the area as they were afraid of being cut off from the rest of Mozambique. Consequently, wildlife populations persisted through the war, with large herds of game migrating between present-day Mágoè and protected areas in neighboring Zimbabwe and Zambia. The region was sufficiently secure for one professional hunter to begin operating in the region in 1988, 5 years before the end of the civil war. From his camp on the lakeshore, he and his clients were able to see artillery explosions across the water (Interview with Professional Hunter).

According to a tourism operator with a long history in Tchuma Tchato and Mágoè, game populations have experienced slow declines across the last 35 years, as human population density and poaching pressures have increased. The park experienced a much-accelerated decline across the last 7 years, due to weakened law enforcement after a change in management (Interview 30). Only black rhinos have been completely extirpated from the region, although populations of most other species have declined significantly. The tourism dynamic in Mágoè is similar to that of Marromeu. While the park itself receives almost no photographic tourists, the hunting concessions surrounding it receive low-volume high-value hunting tourists. Unlike Marromeu,

the concessions around Mágoè also receives fishing tourists, who fish for tigerfish on the lake (Interview 30).

The Portuguese colonial government established Bazaruto National Park in 1971. It is a marine protected area that protects the Bazaruto archipelago and the surrounding waters. It contains important coral reefs and sea turtle populations, and is home to the only viable population of dugongs in Africa.²⁴ The civil war did not impact Mozambique's marine parks in the way it impacted its land terrestrial parks. Fighting was contained to the mainland, and soldiers mostly did not possess the skills to fish. Thus, while hunting pressure on Mozambique's parks skyrocketed in the conflict years, fishing pressure remained relatively constant (Interviews 2, 3, 4, 5, 27). Bazaruto's population of dugongs constitutes an exception to this trend however, falling to 80 individuals during the war and recovering to 150 individuals today (Interview 27). Bazaruto was indirectly impacted by the conflict, as the lack of management allowed wealthy colonial exiles to build homes, high-end lodges, and, in one case, a crocodile farm, on the islands.

While I do not have access to exact tourism statistics for Bazaruto, it is almost certainly the most visited park in Mozambique. Vilankulos, on the mainland adjacent from the archipelago, is one of Mozambique's most important tourism hubs. The park itself is home to four high-end ecotourism lodges, and tourism boats leave for the islands from Vilankulos almost every day. Not all tourists pay entrance fees, however, as rangers have difficulty tracking all boats arriving in the islands (Interview 27).

Findings and Analysis II: The Conservation Landscape in Post-Conflict Mozambique

To learn something about why Mozambique's parks have experienced divergent outcomes post-conflict, we must first understand how the country's post-conflict context has shaped its conservation landscape. This section, then, explores the intersection between conflict and conservation. In it, I ask whether a history of war makes post-conflict conservation different from standard conservation. I hypothesize that in a post-conflict context, the lack of wildlife resources and governance capacity means that conservation is driven by differences in local contexts and by non-state interventions rather than by state institutions.

Effects of War on Mozambican Conservation Estate

Mozambique gained independence from Portugal in 1975. Because higher education was reserved almost exclusively for Portuguese nationals during the colonial period, the exodus of Portuguese colonizers upon independence left the country with very few citizens possessing higher education, and consequently with low governance capacity (Newitt 1995). The Mozambican Civil War, which began in 1976 and lasted until the Rome Peace Accords 1992, effectively paused all higher education in the country for its sixteen-year duration (Mario et al.

²⁴ See IUCN page on Dugongs. <http://www.iucnredlist.org/details/6909/0>

2003). The war devastated the country; it killed approximately 1,000,000 Mozambicans through fighting and associated famine, and displaced at least 58% of rural Mozambicans (Hatton, Couto, and Oglethorpe 2001). Moreover, the fighting almost completely destroyed the country's infrastructure, so that large expanses of rural Mozambique were accessible only by plane in the war's immediate aftermath (Finnegan 1992). Post-war Mozambique, then, was a country turned upside down, with almost no governance capacity or infrastructure, and with vast areas of its rural countryside having experienced enormous social displacement.

This legacy of conflict principally affected Mozambique's conservation sector in three ways. War destroyed the country's wildlife and tourism resources directly, it destroyed the state's capacity to manage those resources, and it destroyed the local power structures that had traditionally helped manage those resources.

War eliminated Mozambique's wildlife resources both directly as soldiers hunted game for food and ivory, and indirectly as displaced non-combatants, unable to grow crops because of fighting, turned to bush meat for food. This inverse relationship between conflict and wildlife holds true across Africa. Conflict is the largest determinant of wildlife trends in protected areas on the continent (Daskin and Pringle 2018). Populations of large mammals fall significantly below replacement level in parks that experience just mild conflict frequency, and are "almost invariably negative in high-conflict sites," a category which included many of Mozambique's parks (Daskin and Pringle 2018).

The negative affect of conflict on Mozambican wildlife was corroborated by every interview subject with which I discussed the subject. Two individuals in Mozambique's hunting sector told me how both armies contributed to wildlife declines in different parks. Renamo soldiers based in Gorongosa – home to the headquarters of Renamo's operation – used Gorongosa's game for rations (Interview 26, 30). Soldiers from a Frelimo base near Zinave, meanwhile, consumed that park's game (Interview 26). Many people told me the story of how Renamo financed some of their fighting with the ivory of Gorongosa's elephants, and of how after the war, a cave with hundreds of elephant tusks was allegedly discovered near Gorongosa (Interview 21, 26, 30). One conservationist with a long history in Mozambique even claimed that "The war in Mozambique finished because the wildlife finished – there was no more food" (Interview 21).

Another conservationist with direct post-war experience explained that among non-combatants, many traditionally agricultural communities evolved a culture of large game hunting to survive, and that they continued hunting game more frequently after the war, when it was no longer necessary to survive (Interview 14). Demining and infrastructure restoration efforts in the war's immediate aftermath further opened up Mozambique's countryside to hunting in the early 1990s, before park operations began to be restored in 1996 (Hatton, Couto, and Oglethorpe 2001). In mid-1994, two years after the end of fighting, the IUCN estimated that 30-60 metric tons of meat were being removed from the greater Gorongosa ecosystem per month (Hatton, Couto, and Oglethorpe 2001).

The war also destroyed Mozambique's tourism infrastructure. Although many of Mozambique's parks were established in the colonial era, most of them received few tourists before the war. They were largely run and policed by ex-soldiers from the Portuguese colonial government and operations were restricted almost entirely to security (Interview 21). Gorongosa was a notable exception, though; it received thousands of tourists per year including celebrities

like John Wayne.²⁵ After Renamo soldiers overran Gorongosa in 1982, they completely destroyed its tourism infrastructure. Maputo Special Reserve, called Maputo Elephant Reserve in the colonial period also received tourists and also saw its infrastructure destroyed in the war. The mining of the country's roads, meanwhile, made less-visited parks like Zinave and Banhine completely inaccessible. Tourists visit parks to view or hunt game, and by the end of the war Mozambique's game was almost completely eliminated.²⁶ War therefore made the rapid restoration of an ecotourism sector impossible, leaving Mozambique's parks with no endogenous source of revenue for reconstruction.

In addition to destroying the country's wildlife resources directly, the civil war undermined the already low capacity of the Mozambican state to manage those resources post-conflict. Because Mozambique's parks were run entirely by the Portuguese in the colonial period, and because black Mozambicans were largely barred from higher education, "there was no local experience in conservation in Mozambique at the time of independence. The closest you came were people trained in veterinary science" (Interview 14). From 1977 to 1981, 28 Mozambicans possessing on average a 6th grade education, were trained for one year in wildlife management at Gorongosa and posted afterward to parks around the country as rangers and wardens (Hatton, Couto, and Oglethorpe 2001). Some of those men were able to pursue additional degrees abroad during the war. Nobody was trained in conservation in Mozambique between 1981 and 1992, however. By the end of the war in 1992, only 16 Mozambicans, many of whom had received just a single year of formal training, remained in the country's conservation sector to begin the restoration process (Interview 21). Moreover, ability in conservation is more defined by what you learn in the workplace than in the education system, so even quickly training new rangers could not make up for the lack of practical experience (Interview 19).

The recovery process, already slow due to the lack of human capacity, was further slowed by the lack of infrastructure and state capacity.

Destroyed infrastructure means that the development curve takes much longer and infrastructure is much costlier. You need infrastructure before you can invest in conservation per se. When we started... [in the late 1990s], opening a bank account took six months (Interview 14)

Some parks were completely inaccessible for years, due to mined roads and destroyed airstrips. Thus, restoring Mozambican conservation was contingent not only upon rebuilding the capacity of the parks, but upon rebuilding the infrastructure and business capacity of the entire country.

Finally, the conflict upended traditional local hierarchies, which traditionally played a role in managing wildlife resources in Mozambique. Due to the scale of internal displacement in

²⁵ See Gorongosa Website. <http://www.gorongosa.org/>

²⁶ Wildlife was spared in only three areas of the country. Niassa in Mozambique's far north experienced almost no fighting, so game populations did not face pressure from armies and displaced rural populations. In Tete, the sliver of territory between lake Cahora Bassa and Zimbabwe (present day Mágoè National Park) experienced no fighting, as Renamo armies were afraid of becoming trapped between the lake and Frelimo-supporting Zimbabwe (Interview 30). Incredibly, one safari operator ran hunting safaris there beginning in 1988, even as mortar fire was visible across the lake from his camp! Both Niassa and Mágoè retained large game populations throughout the war. Finally, the islands off Mozambique's coast - including present-day Bazaruto and Quirimbas National Parks - did not experience fighting.

the countryside, local chiefs were often no longer around to prevent outsiders from hunting in parks after the war (Hatton, Couto, and Oglethorpe 2001). Moreover, the imposition of collective farms and a new centralized government structure during and after the war weakened many traditional leaders' positions of power (Newitt 1995). Research undertaken by De Merode *et al.* in the Democratic Republic of the Congo provides further evidence of chiefs managing access to wildlife resources within traditional African power structures. They found that village chiefs exercise authority to prevent the taking of bushmeat from slow-breeding species in their areas of influence (de Merode, Homewood, and Cowlshaw 2004). Similar processes may have been at work in Mozambique before the conflict. Thus, conflict not only weakened the state-level authority capable of conserving wildlife populations, but also displaced the local-level authorities with the potential to fill those gaps. Although not all parks were affected by fighting equally, from the intensification of Mozambique's conflict in 1982 until the start of conservation restoration efforts in the mid 1990s, all parks were almost completely unmanaged.

The destruction of wildlife, of state capacity, and of local power structures meant that the baseline status of parks directly after the war was very low. Most parks were spiraling downward, with no foreseeable means of generating revenue, minimal government support, and displaced hungry people living and hunting within their boundaries (Hatton, Couto, and Oglethorpe 2001). Moreover, the limited financial and technical capacities of the Mozambican state to manage protected areas in the reconstruction period largely prevented, (and has continued to prevent), state-led restoration efforts. Even today, no park receives sufficient government funding to operate without external aid. In short, the state has not driven conservation outcomes in post-war Mozambique. Rather, local contextual factors and external international factors determine whether parks fail or succeed.

Drivers of Park Outcomes in Post-Conflict Versus Non-Post-Conflict Countries

I hypothesize that conservation systems driven by state institutions evolve differently than conservation systems driven by local factors and international actors. In states with reasonable institutional capacity, state institutions drive conservation outcomes. Institutions act as a homogenizing force on parks, with institutions helping or hindering all parks in a national system simultaneously. In states without institutional capacity, perhaps due to conflict or post-colonial brain drain (or, in the case of Mozambique, both), local factors and international actors drive conservation outcomes. Because local factors are localized to one park, and because most international interventions act on a single park, these sets of factors act as differentiating forces on parks. National parks in a post-conflict country, then, have the potential to experience wildly divergent levels of management quality, as no standardized overseeing government homogenizes their management styles. Instead, each park succeeds or fails independently of others in the system, in accordance with its localized threat level and its level of quality international support. This differentiation of park outcomes is an important feature of post-conflict conservation in Mozambique, and, I hypothesize, in other post-conflict countries.

This paper is concerned mostly with the post-conflict, non-state-driven type of conservation system. I will use most of my space to analyze Mozambique's parks individually, in order to understand how different local contextual and international factors have shaped park outcomes in the post-war period. But first, I will briefly highlight some of the differences between these two types of conservation systems. To do so, I will compare Gibson's analysis of

state-driven conservation in Zambia to my own experience of non-state-driven conservation in Mozambique.

While Zambia, like Mozambique, had few educated citizens upon independence, Zambia did not experience a major post-independence armed conflict. Moreover, Zambia experienced less brain drain than Mozambique; some educated colonizers with experience in conservation remained in the country long enough to help the Kaunda government set up a post-colonial conservation system. Unlike in Mozambique, where civil war prevented the Frelimo government from strengthening parks' capacity, the Zambian government was able to build a functioning conservation institution and operate ranger corps throughout the country's conservation areas (Gibson 1999).

Gibson drew from his fieldwork in Zambia, and to a lesser extent in Zimbabwe and Kenya to outline his "New Institutionalism Theory of Conservation," in which he suggests that the politics of heads of state and of mid-level bureaucrats drive countries' conservation agendas. According to Gibson, government conservation officials build institutions in order to bolster their own power. Conservation continued in post-independence Zambia, despite opposition from most of the population, for two reasons. First, President Kaunda liked wildlife and punished opposing politicians who did not agree with him. Second, bureaucrats and politicians used wildlife jobs, concessions, and game meat to reward their followers. Thus, in the first decade after independence, top-down state pressure strengthened conservation areas in synchrony across the Zambia.

But from 1972 onwards, the shift to a one-party state caused Zambia's entire conservation sector to decline. Where before politicians had supported conservation initiatives as allies of president Kaunda, in the new one-party state candidates distinguished themselves by politics rather than party, and so opposed conservation initiatives in order to become popular with their constituents. This change in politics was not the only contributor to park's declines; a wave of international poaching due to rising demand for wildlife products also stressed protected areas. But politics certainly played a role. Again, top-down state pressure affected conservation areas in synchrony, this time weakening rather than strengthening the country's parks (Gibson 1999). Gibson observed a similar dynamic of state-driven conservation outcomes in Zimbabwe and Kenya. And that dynamic can also be observed in Botswana, where revenue from ecotourism has allowed the state to strengthen parks across the country.

In Mozambique, however, the state has not had the capacity to simultaneously shape conservation outcomes across the country. As we have seen, the Mozambican government was not present in the country's protected areas through the civil war, or in the immediate post-conflict period. Even now, 25 years after the civil war, the impact of the state on protected areas is nominal. Just 16% of protected area funding in Mozambique came from the government in 2014 (Liphola and Ribeiro 2015). Parks without international donors, such as Banhine and Mágoè, still possess almost no management capacity. Banhine has just 36 employees to manage 7,250 km² and Mágoè just 16 to manage 3745 km² (Interview 29).²⁷ In both parks, rangers rarely patrol outside of scattered ranger stations, in part because neither park possesses any patrol vehicles (Interview 29; Interview 31). Evidently, the Mozambican state has not driven protected area outcomes, because for most of the country's history the state has not had a presence in its parks.

²⁷ Data from Biofund. See <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/>

An observer of Mozambique's conservation system might object that the explosion of conservation-oriented laws and formal reports in the 1990s suggests a deeper level of state commitment to protected areas. Mozambique ratified the United Nations Convention on Biological Diversity in 1994, passed a comprehensive "Environment Law" and a "Policy for the Strategic Development of Forests and Wildlife" in 1997.²⁸ But almost every conservationist I interviewed with long-term experience working in Mozambique complained about their lack of implementation, especially in the late 1990s and early 2000s (Interviews 14, 19, 21). To quote one conservationist, "there were lots of new laws being created under the visionary leadership of [President Joaquim] Chissano, but no ability to apply those laws." I was repeatedly told that only the 2014 Law on the Conservation of Biodiversity, which dramatically raises penalties for poachers, has had a marked impact on improving conservation outcomes.

The lack of a force homogenizing Mozambican park outcomes is manifest in their wildly divergent outcomes. Protected areas cover the spectrum from paper parks with absolutely no management, such as Mozambique's forest reserves, to reasonably well-functioning protected areas, such as Gorongosa. Because the state does not drive protected area functioning, park outcomes are largely the result of local and international factors, which differentiate park outcomes. To understand why Mozambique's parks have experienced divergent recoveries, then, we must explore these local and international factors, determining which contextual and international variables help and which hinder park development.

Findings and Analysis III: Factors Shaping Divergent Recoveries of Mozambican Parks

Introduction and Framework

The state, as we have already seen, largely does not drive park outcomes in Mozambique. Instead, the lack of state presence in Mozambique's protected areas provides room for local contexts and international interventions to drive parks to success or failure. In this section, I attempt to identify the key factors influencing park outcomes in Mozambique, and to understand how each factor has shaped park outcomes since the end of the war in 1992. I organize the factors into four categories: state based factors, context-based factors, intervention-based factors, and community-based factors.

First, state-based factors are "top-down" meaning that they stem from the government. They are homogenizing factors that generally affect all parks in the country together, varying over time rather than between conservation areas. They include variables like government funding level, government capacity, and bureaucratic efficiency. In Mozambique, state-based factors have mostly not impacted park recoveries, although there are a few important exceptions.

Second, context-based factors are bottom up, meaning that they are based in the local surroundings of each park. They are differentiating factors, as they are unique to each park. They include variables like a park's geographic location, its abundance of natural resources, its level of

²⁸ *Ibid.*

human habitation, and its annual rainfall. Context-based factors tend to exacerbate or mitigate threat levels to parks, and have thus played an important role in determining park recoveries. For example, a park's location near an international border might drive cross-border poaching, while another park's location in uninhabitable terrain might preclude poaching by subsistence hunters.

Third, intervention-based factors describe the impacts of the many international conservation organizations that operate within Mozambique's borders. These factors are generally differentiating, as over a dozen organizations operate with varying levels of authority and effectiveness in different protected areas. Intervention-based factors include variables like the access to international funds, the relationship between the international organization operating in a park and the government, and the management priorities of the partnering organization. Intervening organizations often undertake roles that the government would fulfill in higher capacity states, such as raising money, training rangers, and interacting with surrounding communities.

Fourth, community-based factors describe the relationship between a park's management and the communities surrounding the park. I place this relationship in its own category as it is heavily dependent on both context and intervention style, and therefore does not fit well into any of the three preceding categories. Communities are of course contextual; each local community borders just one of Mozambique's protected areas. But I found that the quality of the relationship between a community and a park is almost always driven by the policies of the international organization operating within a park. In parks without international interventions, I was told that park authorities generally did not interact with local communities at all. Community-park relationships differ in quality and in direction. For example, communities can shape park outcomes by depleting wildlife populations through poaching, or by supporting wildlife populations by blocking access routes used by foreign poachers. And parks, in turn, can impact the communities that surround them both positively and negatively. They can deprive community members of access to land and resources, but they can also provide community members with jobs in the conservation and tourism sectors, and with services like education and infrastructure through community outreach programs.

The divisions between these four categories of factors are not always clear, as each group of factors can influence the others. Differences in park contexts, such as varying levels of aesthetic beauty or of threat, play a key role in attracting international interventions. Similarly, intervening organizations can change contexts, as they create infrastructure that increases park accessibility or create new relationships with surrounding communities. I will address these intersections whenever possible. Nevertheless, I maintain that grouping the variables into these four categories is worthwhile and allows for easier reading.

Finally, the factors I have identified as important in shaping park recoveries are likely not comprehensive. I identified these factors based on my conversations with stakeholders over my ten weeks in Mozambique, and may have missed some. Neither are these factors meant to be singularly explanatory. Protected areas recoveries are complex and context-dependent; they defy easy explanations. Nevertheless, I believe that even an imperfect examination of these factors can help us better understand why Mozambique's parks have experienced divergent recoveries in the 25 years since the end of the Mozambican civil war.

State-based Factors

The Mozambican state primarily affects the country's protected areas in two ways. First, the state directly impacts park management through the country's force of rangers, which are responsible for law enforcement activities in most of the country's parks. Second, the state indirectly impacts park outcomes through its bureaucracy, because international organizations attempting to operate in Mozambique must navigate Mozambican bureaucracy to acquire the authority to do so.

Law Enforcement

Inadequate funding and human capacity in the Mozambican government means that the role of the state in park management is entirely limited to law enforcement, and that even in its law enforcement operations, the state is relatively ineffective. One state official with decades of experience working both in and out of Mozambique, emphasized the difference between park management in developed countries and in Mozambique, telling me "I've seen thousands of parks [outside Mozambique] and we in Mozambique aren't running our parks, we're just doing law enforcement. There's no wildlife management, there's no tourism, we're not doing that" (Interview 21). No fully-state-run park in Mozambique has tourist lodgings or wildlife management officials; almost all non-law enforcement activities in the country's parks are supported by international NGOs.

Moreover, even the law enforcement activities carried out by the state are hamstrung by lack of funding, a lack of quality education, and, in some cases, incompetent personnel. One conservationist with a broad knowledge of Mozambique's protected areas told me of the national conservation apparatus ANAC, "ANAC uses its funding just to keep itself afloat and running. It can't actually accomplish anything" (Interview 1). Labor laws in the country make incompetent government employees, including rangers, extremely difficult to fire. Moreover, rangers are paid a fixed salary for being present rather than for getting things done. The result is that many rangers in the government-managed parks like Banhine and Mágoè rarely leave their posts to go out on patrol. Some rangers are too old to patrol anyway, and some are corrupt, accepting bribes from poachers (Interview 1, 17). There are, of course, hardworking and competent rangers as well. But just a few incompetent or corrupt rangers can provide poachers opportunities to devastate animal populations.

The lack of systemic strength means that the competent rangers are difficult to replace when they retire or leave (Interview 22). And they leave often, since government-managed parks are limited by a badly-paying government salary structure, and are therefore unable to incentivize competent rangers to stay when they are offered more lucrative jobs elsewhere (Interview 1). Moreover, even motivated rangers are constrained by a lack of infrastructure and gear. When I visited Mágoè National Park, I learned that the park staff do not possess a single car. Rangers have to walk, bicycle, or hitchhike between their posts, which can be 50 or 60 kilometers apart. Because I had a car, I drove two rangers on a twelve-hour-long patrol drive, an ordinary law enforcement exercise in a standard protected area that is normally impossible in Mágoè.

The role of the Mozambican state in its parks, then, is shaped more by the absence of an impactful state than by its presence. Rangers in state-run parks are understaffed, underfunded, and rarely go on patrol. Thus, while the lack of state present does not directly drive parks to failure – we rarely see park management systematically robbing parks’ assets in Mozambique – it does not drive parks to success either. Consequently, park outcomes are shaped by the unique array of contextual threats attached to each park and by the international interventions taking place in each park, rather than by the competence of the ranger force.

Bureaucracy

One way in which the Mozambican state does sometimes harm Mozambican conservation is via bureaucratic ineptitude. The slowness and incompetence with which the Mozambican state fulfills some of its conservation-oriented bureaucratic duties can harm tourism operators in the country and impede international organizations as they attempt to strengthen parks.

Bureaucratic slowness is especially impactful in the two protected areas bordering South Africa, Limpopo National Park and Maputo Special Reserve, as it has prevented the parks from gaining access to resources on the South African side of the border. In Limpopo, tourists visiting bordering Kruger National Park (which receives over one million tourists per year) must pay visa fees and fulfill arduous customs procedures to enter Limpopo. Because many tourists visiting Kruger complain that the park is too crowded, even while Limpopo is nearly devoid of visitors, park authorities believe there is plenty of demand for Limpopo among South African tourists. But the fees and procedures required to enter Limpopo’s hamper its ability to tap into Kruger’s lucrative tourist pool. In February 2016, Mozambican authorities and the Limpopo park management team held a meeting to resolve the problem and agreed that they should create a visa-free zone in Limpopo National Park for tourists visiting from Kruger (Interview 11). However, two years later there has been no progress. Thus, in Limpopo, incompetent bureaucracy may be preventing the reception of thousands of tourists per year.

In Maputo Special Reserve (MSR), which borders South Africa’s Tembe Elephant Reserve, bureaucratic concerns on both sides of the border have prevented park management from opening the fence separating the protected areas. Doing so would allow game in South Africa to repopulate MSR, which is currently far below its wildlife carrying capacity and is undertaking an expensive animal translocation project, financed and organized by the Peace Parks Foundation (PPF). Mozambican authorities worry that opening the border would harm Mozambican farmers. They assert that diseased South African buffalo and livestock-eating lions would take a toll on farmers’ cattle. The South Africans, meanwhile, are also reticent about opening the border fence. They fear that doing so would give Mozambican poachers freer access to South Africa’s rhinos (Interviews 15, 17, 18). In MSR, unlike in Limpopo, potentially valid concerns are slowing the opening of the park’s borders. Nevertheless, the Mozambican bureaucracy has not reached a cohesive position, leaving the Peace Parks Foundation in limbo, as to whether it should continue importing animals into MSR from elsewhere or make another push to open the border fence.

Mozambique’s slow bureaucracy has hurt tourism operators attempting to do business elsewhere in the country as well. One hunting operator working in a concession adjacent to a national park or reserve told me that the failure of Mozambique’s representative to CITES to turn in his

paperwork for hippopotamus hunts for the year 2017 cost him thousands of dollars of potential revenue (Interview 30). And a conservationist complained to me about the concessions process in the country's national parks, a mainstay of ecotourism in other countries in the region. Because key senior Mozambican tourism officials do not understand that concession operators are not going to pay high prices for concessions initially, but that concession prices in nascent parks typically start low and increase over time as concessions gain fame among tourists, the officials refuse to give up the exclusive rights to even small concessions of 10,000 hectares in 500,000 hectare parks (Interview 19). Because the Mozambican government does not operate lodges in its parks, concessions are one of the only potential sources of tourist revenue for them. The bureaucratic holds on the concession process, then, likely cost the country's conservation areas substantially.

Overall, then, the state has played only a minor role in determining which Mozambican parks have recovered in the post-war period. State-funded law enforcement has not contributed much to the recovery process, and the state has had no hand in creating wildlife management or tourism policies. The state has perhaps been most impactful in transfrontier parks, where an incompetent bureaucracy has prevented parks from tapping into cross-border tourism markets and wildlife populations. But mainly, the local contexts of each park have been the key internal drivers of park outcomes.

Context-Based Factors

Local contexts have shaped park outcomes mainly by exacerbating or mitigating threat levels to protected areas. In this section, I identify and describe the impacts of three classes of context-based factor: (1) the location of each park, (2) the natural and aesthetic resources of each park, and (3) the presence of people in and around each park.

Location within Mozambique

A park's location within Mozambique has enormous bearing on its ability to recover from civil war. A park's proximity to an international border or to Maputo, its location in traditionally Renamo or Frelimo territory, its accessibility to tourists, and its accessibility to poachers can all inform its recovery process.

A park's closeness to an international border can both hurt it by increasing its vulnerability to international poaching, and help it by increasing its access to bordering wildlife populations, to better management, and to support from the Peace Parks Foundation (PPF), an NGO that specializes in supporting Southern African transfrontier parks. In Limpopo National Park, the shared border with Kruger has created a poaching epidemic, as commercial poachers traverse Limpopo to reach Kruger's valuable rhino populations. One conservationist described the villages inside Limpopo as home to "powerful crime syndicates" that profit off of rhino horn and ivory. He described the village leaders as opposing the parks resettlement initiatives because they worry losing access to the park would cut them off from their poaching revenues (Interview 23). Another conservationist corroborated that negative assessment of the villagers inside Limpopo, noting that because of Kruger's rhinos and elephants, there is more poaching inside Limpopo than anywhere else in the country (Interview 17). That said, the portion of poachers infiltrating

Kruger from Mozambique as a percent of total poachers has fallen from 70% to 11%, according to Kruger law enforcement officials, likely because rhinos in the part of Kruger that borders Limpopo have been almost entirely wiped out (Interview 23). But one person familiar with Limpopo's poaching epidemic worried that as rhinos disappear, poaching kingpins will turn to other sources of revenue, such as ivory, lions, and vultures, which are used by traditional healers (Interview 14). That transition may be already underway, as rangers in Limpopo have reported rising instances of lion and vulture poisonings (Interview 11). Thus, the presence of rhinos in Kruger has sparked a commercial poaching epidemic in Limpopo even the local extirpation of rhinos may not stop.

Mágoè has also been experiencing an international poaching problem, albeit centered around elephants. Mágoè borders Zimbabwe, and is only a few dozen kilometers from Zambia. A conservationist familiar with law enforcement in Mágoè and the surrounding hunting concessions told me that most of the commercial elephant poachers they catch are not Mozambican. They tend instead to come from Zimbabwe, Zambia, and Congo (Interview 30). Law enforcement in Mágoè is weaker than in the adjacent parks in Zimbabwe and Zambia; there are fewer rangers per square kilometer and rangers have less access to equipment and vehicles. Mágoè was not directly affected by the war, so elephants were able to survive in the region until the present. But the current poaching epidemic, which began after the installation of a corrupt warden in the park in 2013 (who has since been removed) has caused their populations to decline precipitously (Interview 29).²⁹ Thus, in both parks, the lack of state capacity combined with an international border has driven poaching, although it has done so in different ways. In Limpopo, weak law enforcement has allowed poaching syndicates to develop inside the park, and Kruger's rhinos have provided a lucrative source of income. In Mágoè, weak law enforcement has allowed poachers from neighboring countries to enter the park without penalty, and Mágoè's elephants have provided the source of income.

Borders are not all bad, though. In both Limpopo and Mágoè animals in neighboring countries have bolstered animal populations. In Limpopo, I observed a stark divide in wildlife numbers between the area close to the Kruger and the other areas of the park. A person working in the park verified that dynamic, saying that animals exist in Limpopo in a gradient; as animals enter Limpopo and move away from the border, they slowly get poached off, so that animals are almost entirely absent from the areas of the park farthest from South Africa (Interview 11). This dynamic has allowed rangers and tourism operators to concentrate their efforts in the small portion of the park bordering Kruger. Without the constant replenishment of animals from South Africa, it is possible that poachers would have eliminated animals in the park years ago, eliminating the tourists who come to see them as well.

Conservationists in Limpopo and Maputo Special Reserve also observed that access to South Africa's higher-capacity management teams have improved park operations on the Mozambican side of the border (Interviews 10, 16, 23). In a program termed "Operation Capricorn," rangers from Kruger and Limpopo do joint patrols at least once per month. Joint patrols take place in Maputo Special Reserve as well (Interviews 16, 23). Park management teams in Limpopo and Kruger coordinate at higher levels too, in a joint park management committee and a joint

²⁹ Just before leaving Mágoè, the corrupt ex-warden burned all the park's paper files, according to a law enforcement official familiar with the park (Interview 28)

management board. That coordination allows protected area managers on both sides of the border to learn from one another, increasing human capacity in both parks. Nevertheless, animal populations per km² in both Limpopo and Maputo Special Reserve remain a fraction of their counterparts in South Africa. Joint management and patrols, it seems, can only do so much without access to South African funding.

Proximity to an international border also ostensibly provides Mozambican parks with access to support from the Peace Parks Foundation (PPF), an NGO that funds transfrontier parks in Southern Africa. PPF's operations are not directly correlated with proximity, however. In addition to supporting Limpopo and MSR, the organization supports Banhine and Zinave, neither of which are adjacent to an international border. Moreover, it does not support Magoè despite the park's border with Zimbabwe. Thus, while location would seem to provide a park potential access to PPF funding in theory, in practice the relationship between location and funding is not so simple, as PPF considers other variables such as prominence and projected cost when selecting parks.

In Maputo Special Reserve, proximity to Maputo has played a major role in park recovery, in addition to proximity to South Africa. MSR's nearness to the Mozambican capital increases its tourism potential enormously. When the bridge connecting Maputo and Catembe is completed in the 2018, MSR will be just forty minutes from Maputo by car. Multiple conservationist told me that growing wealth in Maputo means MSR may be financially self-sufficient within the next decade, perhaps receiving 40,000 tourists per year (Interview 14). It is the only park in the country with the potential to be self-sufficient in the short to medium future (Interviews 12, 14, 19).

The relationship between parks' recoveries and their locations in historically Renamo or Frelimo aligned regions of the country is less clear. Diallo posits that Gorongosa's location in a Renamo stronghold caused the country's Frelimo government to be more willing to cede authority to the Gorongosa Restoration Program, the NGO – financed and run by philanthropist Greg Carr – tasked with restoring Gorongosa. One conservationist hypothesized that the presence of armed Renamo soldiers in the park actually helped shield the parks wildlife by blocking access to urban poachers (Interview 14). The 95% decline in animal numbers over the course of the war would seem to undermine his claim, however (Stalmans and Peel 2016).

Other stakeholders suggested that Gorongosa's location in a Renamo stronghold has hurt its ability to recover, by scaring off tourism operators. The flare-up of the conflict in 2013 apparently caused one major tourism investor to pull out of the park, and the threat of future flare-ups may be preventing others from committing to the park (Interview 26). Zinave's location, across the Save river from the traditionally-Renamo province of Manica has caused tourism operators to be wary of investing there as well, although the construction of a new lodge is underway (Interview 26). Thus, the quality of the relationship between park recovery and political alignment, much like the quality of the relationship between park recovery and proximity to an international border, is unclear.

The remoteness of a park, coupled with the quality of its terrain, has also shaped park recoveries. Relatively inaccessible parks, like Banhine and Marromeu, tend to have difficulty attracting

tourists and donors. Banhine, Zinave, and Marromeu are all relatively far from major tourism hubs. All have been unable to attract more than a few dozen tourists per year, and only Zinave has attracted major investment (and that only in the last two years). Banhine is especially remote, at two days' drive on poorly-maintained roads from the nearest major cities: Vilankulos and Limpopo. Moreover, it lacks the spectacular features that could make the long trip worth it to tourists. While it is ecologically important due to its seasonal wetland and its location between Limpopo, Zinave, and Gonarezhou National Parks, the quality of the wetland is driven by a ten-year precipitation cycle. Banhine is often unglamorously dry (Interview 8). There is therefore hesitation to invest in the park because there is a sentiment among conservationists that it will never reach self-sufficiency (Interviews 14, 31).

Isolation can also insulate parks from poaching pressures, however, as evidenced by Marromeu's rebounding buffalo population. Marromeu's buffalo were decimated by the civil war, possibly due to the presence of a Soviet meat-canning ship off its coast (Beilfuss, Bento, and Haldane 2010, Interview 30). However, the park's buffalo population has recovered faster than any large mammal population in the country, except Gorongosa's population of waterbuck. And that, despite no investment in the park and only minimal law enforcement presence. Every stakeholder with whom I spoke about Marromeu credited that recovery to the park's inaccessibility. The swampy terrain prevents easy access on foot, but the lack of open water prevents easy access by boat (Interviews 1, 7, 12). In Zinave and Banhine, two parks similarly distant from major cities, drier terrain allow poachers to access animals even when tourists cannot (Interview 12).

The proximity of Marromeu to hunting concessions or "coutadas" may also have played a role in its recovery. Marromeu is bordered by coutadas 10, 11, and 14 on three sides, which together with the adjacent coutada 12 form the "Marromeu conservation complex." All coutadas are privately-owned, mostly by white expatriates. The quality of management varies widely, depending on the competence of the owner, his relationship with local communities, and his access to funds (Interview 26).³⁰ Because hunting safaris are substantially more lucrative than photographic safaris, coutadas operate under a different set of rules than publicly-owned protected areas. According to one conservationist with knowledge of hunting concessions, a hunting coutada only needs about three safaris per year to break even on costs (Interview 1). Moreover, the private status of coutadas means that they are not constrained by public sector labor laws, and can therefore hire and fire talent more easily. As such, some of Mozambique's more successful coutadas have maintained mammal populations, even as the country's parks have lost them. One hunting operator even claimed that Coutada 9, in Manica Province, is the most successful conservation area in Mozambique (Interview 26). Law enforcement teams in the hunting concession that surround Marromeu, then, may unintentionally limit poachers' access to the reserve. This limitation, in conjunction with its swampy terrain, likely explains Marromeu's unique recovery. Marromeu is thus unique in Mozambique for two reasons. First, it is the only park in Mozambique that has experienced an ecological recovery despite a total lack of investment and an almost total lack of law enforcement. Second, it is the only park in Mozambique where post-war recovery is mostly explainable by just two factors. Marromeu has

³⁰ A researcher could probably write an entire other paper entitled "Understanding Divergent Recoveries in Mozambique's Hunting Concessions," although the opacity of concession management would make that paper substantially more difficult to research than this one.

recovered primarily because the hunting concessions surrounding it make it difficult to enter, and because the swamps within it make it difficult to navigate.

Mágoè also borders hunting concessions, and was classified as a coutada itself before its elevation to park status in 2013. But the coutadas surrounding it are less well-managed than those of the Marromeu complex, according to several people with knowledge of Mozambique's hunting sector (Interviews 26, 30). Mágoè's border with Zimbabwe also makes it vulnerable to international poaching. Nevertheless, Mágoè's former status as a coutada, and its current status as a park surrounded by coutadas, may have played a role in arresting the extirpation of its wildlife.

Natural and Aesthetic Resources

The natural and aesthetic resources of Mozambique's parks have also shaped their recoveries, especially by informing which parks international organizations invest in, and which parks tourists visit. Gorongosa's high biodiversity played a key role in the decision by Greg Carr, the president of the Gorongosa Restoration Project (GRP), to invest in the park. Gorongosa likely has the highest biodiversity of any Mozambican protected area and was described by the renowned biologist E.O. Wilson as "ecologically the most diverse park in the world."³¹ Carr visited six Mozambican parks before choosing to invest in Gorongosa. But he had done his homework before setting foot in the country, and was already leaning toward Gorongosa due to its high biodiversity (Gourevitch 2009; Interview with Carr). Thus, Gorongosa's biodiversity played a major role in its attracting what is probably the most successful conservation intervention in Mozambique. Gorongosa's biodiversity has also helped make it a national icon. One conservationist noted that the "importance of Gorongosa as one of the icons and one of the remaining protected areas on Earth with the amount of biodiversity that it carries and the signature brand that it is for conservation and tourism" has been helpful when raising support among stakeholders, from local community members to high ranking government officials (Interview 7).

The high aesthetic value of Mozambique's coastal protected areas, including Maputo Special Reserve and Bazaruto National Park, has played a role in shaping their successes. Both of the aforementioned parks possess spectacular coastline, with white-sand beaches and offshore coral reefs. Bazaruto, due to its ecological attractiveness and its proximity to Vilankulos Airport, already functions as one of Mozambique's major tourism hubs. It receives thousands of tourists per year. MSR is currently harder to reach, although the completion of the Maputo-Catembe bridge will change that. And if the fence between MSR and South Africa's Tambo Elephant Reserve is dropped so that South African animals can reenter the park, MSR will be the only park in Mozambique to have both big five animals a spectacular coastline (Interview 15). MSR's aesthetic beauty has already helped it attract support from the Peace Parks Foundation and from international donors. While the park is far from recovered, its beauty and location give it unique tourism potential in Mozambique.

³¹ See: <http://www.gorongosa.org/blog/park-news/edward-o-wilson-biodiversity-lab-opens>

Presence of People in and Around the Park

Population density within and outside Mozambique's protected areas have affected park recoveries in contradictory ways. High population densities within parks contribute to poaching, although population density is certainly not the only factor shaping poaching intensity. The proximity of a park to an international border and the effectiveness of a park's law enforcement team play roles as well. Nevertheless, some conservationists in Mozambique have argued that high population densities within protected areas make conservation difficult, especially if a park's status and purpose is not communicated effectively to its inhabitants due to lack of state capacity. One conservationist familiar with MSR complained that for wildlife in the park, "people are the problem," noting that their fires, snares, and cattle have effectively eliminated game from the northern and eastern portions of the reserve (Interview 15). In Limpopo, too, multiple conservationists described the people in the park as poaching heavily. I was told that maintaining an effective law enforcement presence would be impossible until all the villages in the park were relocated, because people from the villages can poach at night, out of sight from law enforcement officials, with impunity (Interviews 11, 23). Zinave, by contrast was described as having a relatively small poaching presence due to its low population density and lack of commercial poaching operations. While the official survey lists Zinave as having 5776 people living within its bounds, a conservationist familiar with the park told me that it probably only actually hosts 300 households, as the government surveyors likely counted villages outside the park due to their ignorance of the park's boundaries (Interview 26). Gorongosa also has few people living in the core of the park. Like Zinave, its poaching burden seems light, although that may be a function of the park's well-financed law enforcement team, paid for by the Gorongosa Restoration Project. There seems, anecdotally at least, to be an inverse correlation between in-park population density and poaching pressure in Mozambique.

Interestingly, however, Daskin and Pringle found a positive correlation between large herbivore populations in parks and the human population densities in the region surrounding park, in a study examining over 3500 protected areas across Africa (Daskin and Pringle 2018). While other studies have corroborated this finding, no researchers have adequately explained it, and it is a desired area of future study among warfare ecologists (Brashares, Arcese, and Sam 2001; Fritz, Bininda-Emonds, and Purvis 2009). Perhaps local communities surrounding parks and benefitting from park revenues help to stop international poachers. Neither has the relationship yet been examined within Mozambique. If it holds true there, it would add an interesting, if inadequately explained variable to the factors shaping park recoveries in the country.

Intervention-Based Factors

International interventions have shaped park recoveries as conservation organizations have undertaken some of the roles the government would fulfill in higher capacity states, with varying degrees of success. In this section, I identify and describe the impacts of five classes of context-based factors that have shaped park recoveries: (1) funding level and allocation, (2) management style, (3) management priorities, (4) park resident resettlement strategy, and (5) law enforcement quality.

International conservation organizations currently support five of the eight protected areas I examined in detail. Peace Parks Foundations operates in a technical support role in Limpopo and MSR, and in a more involved comanagement role in Zinave. The Gorongosa Restoration Project, previously called the Carr Foundation, operates in Gorongosa. African Parks is currently in the process of signing a comanagement agreement with Bazaruto National Park, and a few marine conservation NGOs, including the Marine Megafauna Foundation currently work with the park's management. Banhine is not currently supported by any international conservation organizations, although the African Wildlife Foundation operated in the park until 2012, before leaving due to lack of donor interest. Marromeu and Mágoè have never experienced targeted support from conservation NGOs.

Funding Level and Funds Allocation

Differences in the quantity of funding available to park management, the consistency of the funding, and the flexibility of the funding have all shaped park recoveries in Mozambique. According to Biofund, a private financial institution with the aim of financing the conservation of biodiversity in Mozambique, parks in the country require about \$500 per kilometer per year to fund effective management and law enforcement. Of the protected I examine here in depth, only Gorongosa and Maputo Special Reserve receives that level of funding.³² Greg Carr, an American philanthropist who made his fortune in voicemail technology, has invested \$40 million in the park since 2004, and other donors have invested an additional \$45 million for a total investment of approximately \$85 million. In Maputo Special Reserve, donors coordinated by the Peace Parks Foundation are investing approximately \$14 million over the course of ten years. That level of funding provides Gorongosa about \$1500 per year per km² and provides MSR about \$600 per year per km². In Limpopo, donors coordinated by the Peace Parks Foundation have invested about \$45 million in the seventeen years since the park's establishment, more than any of the parks I examined except for Gorongosa. However, the vast majority of that money in Limpopo has been used to finance the park's resettlement process, rather than to fund operational expenses (see section on Resettlement for details on this). In fact, 64% of the money for operational expenses comes from gates fees paid by tourists passing through Limpopo rather than from international organizations, a dynamic unique among Mozambique's terrestrial parks. Those gate fees plus non-resettlement donations have left Limpopo with about \$250 per year per km² to put toward operational expenses. Zinave also receives about \$250 per year per km², although it receives far less money than Limpopo overall, due to the lack of a resettlement program. Finally, Banhine, Marromeu, and Mágoè receive no external funding.

Comparing funding levels to park's ecological recoveries reveals a loose coordination between the variables with several important exceptions. First, Limpopo has largely failed to recover despite receiving the second highest funding level of any terrestrial park in Mozambique. Every conservationist with whom I discussed that dynamic explained that discrepancy as a function of the high cost and low impact of the park's resettlement program, which has left little money for other priorities (Interviews 1, 12, 17, 23). Allocation of money, in addition to quantity of money, matters. Second, Marromeu has experienced a major ecological recovery despite receiving no

³² All funding data from Biofund. See <http://www.biofund.org.mz/en/database/platform-of-the-conservation-areas/>

donor support. Marromeu's success illustrates that given the right conditions – namely inaccessible terrain and a buffer of hunting concessions – a park can recover unfunded.

Disregarding Marromeu and Limpopo, parks with money have recovered, and parks without have not. Gorongosa, the best-financed park has seen the greatest ecological recovery. MSR, the only other park to surpass the \$500 per km² threshold has seen a moderate ecological recovery. And Zinave and Banhine, both of which receive very little funding, have experienced almost no ecological recovery. Mágoè, which also receives very little funding, as experienced a steady ecological decline.

This anecdotal relationship, however, raises chicken-egg questions, as donors may be more willing to invest in the parks deemed as having the greatest chance of recovery and in parks that already receive some tourists. The best-financed parks – Gorongosa, Limpopo, and MSR – all receive more than 5,000 tourists per year. The worst-financed parks, Zinave, Banhine, Marromeu, and Mágoè all receive fewer than 100 tourists per year. This relationship may be a function of infrastructure, as well-funded parks are able to invest in lodges and marketing, while poorly-functioning parks are not.

The flexibility and consistency of funding, in addition to the quantity of funding, have also affected parks' recoveries. One conservationist familiar with park funding strategies explained Gorongosa's success as a function of funding consistency and flexibility, rather than of sheer quantity. Unlike Limpopo and MSR, in which the Peace Parks Foundation coordinates funds from many sources, Gorongosa is funded in large part by a single person, Greg Carr. As such, Carr is able to fill any spending gaps himself immediately, and is able to streamline additional donations under a single coordinated management strategy (Interview 1). In Limpopo and MSR, by contrast, funds mostly come from the World Bank and European governments, and are often targeted toward specific programs. This can cause problematic funding gaps. In Limpopo, for example, entrance fee revenues for 2017 did not return to the park, likely due to corruption. Because those revenues account for 64% of the park's operating budget, and fund key programs including law enforcement, the money's disappearance caused a crisis in the park (Interview 23). If resettlement funding from the World Bank and European governments could be reallocated to law enforcement it would have more than made up for the funding gap. Unfortunately, the lack of flexibility in spending makes that impossible. And because there was no philanthropist to fill the gaps, Limpopo's law enforcement capacity suffered.

Maputo Special Reserve is also vulnerable to the ebbs and flows of funding. A stakeholder at the park explained to me how a gap between the end of a funding cycle from the Peace Parks Foundation and the start of a subsequent funding cycle from the World Bank crippled the park's management. Because of the funding gap, the park management was unable to hire a team to maintain the park's game fence for a period of months, which caused the park's forward progress to halt and reverse (Interview 15). Another stakeholder complained that getting purchases approved through World Bank funding is a slow and arduous process. For example, a procurement for land cruisers could easily take over a year to be approved (Interview 17). The inflexibility of the purchase process at MSR contrasts markedly with the purchase process at Gorongosa, where Carr is able to fund purchases for the park almost immediately after the park's management recognizes the purchases as necessary (Interview 1).

Management Style

The relationship between the organization managing a park and the Mozambican government has also shaped park recoveries, with more autonomous management structures tending to be more successful. There is a consensus among conservationists in Mozambique that comanagement of the country's parks is necessary, due to the lack of government funding and capacity (Interviews 1, 15, 17, 28, etc). Styles of partnership vary, from limited technical advisory in MSR and Limpopo to comanagement in Zinave and almost completely independent management in Gorongosa.

Under technical advisory agreements, intervention operators are limited to providing advice. In the words of one stakeholder, technical advisors can “show a construction worker in the park how to hammer a nail in correctly, but cannot force him to do it” (Interview 15). Technical advisers also are limited in their ability to set priorities, as they can only recommend actions to the state-controlled park management. That makes technical advisers vulnerable to criticism when a park experiences a problem, because they become associated with the problem even if the advice they give is not followed by park management.

But perhaps the biggest problem associated with technical advisory is the lack of control advisors can exert over hiring and firing decisions. Because the park managers and technical advisers must operate under government salary structures, they cannot offer competitive rates. One stakeholder at MSR explained that the park had lost many of its most competent workers to a Chinese road-building company and was consequently having a difficult time maintaining the park's game fence (Anonymous Interview). Because of government salary limitations, park management was unable to provide competitive wages to retain talent, and technical advisers, unlike co-managers, are not able to offer extra non-salary compensation.

Under comanagement agreements, like the ones implemented in Zinave and Gorongosa, the international NGO has greater leverage. The government, represented by the warden, retains authority on decisions regarding the day-to-day management of rangers. But all decisions regarding park strategy and performance management and discipline of staff must be made jointly. Unlike technical advisers, co-managers can supplement warden and ranger salaries so that they receive market-competitive wages. Wage supplements have been particularly important in boosting ranger morale in Zinave, which suffered from a major illegal logging crisis. The Peace Parks Foundation implemented a program that paid rangers a bonus for each snare they removed from the park. Moreover, the rangers received half of the fines levied on captured logging trucks, which constitute an enormous boost to their salaries. Finally, rangers were equipped with GPS trackers, so that the warden and his comanagement partners could follow their movements on patrol and ensure that they covered a reasonable amount of territory. Within a year of the implementation of these programs, Zinave's park management was able to halt almost all illegal logging and greatly reduce poaching in the park (Interviews 25, 26). These programs are relatively new, so it is still too early to say whether they will allow Zinave's animal populations to recover and attract tourists. But the future for the park looks bright.

Gorongosa is the park in which the intervening NGO has the greatest independence from the government. While Gorongosa is technically run under a comanagement agreement, the Gorongosa Restoration Project pays all salaries and works extensively with the warden to oversee ranger hiring and management decisions. One conservationist described the rangers at Gorongosa as the most motivated in the country, due to the high quality of their training and management, and their high wages. Moreover, Gorongosa's money and management autonomy has allowed the Gorongosa Restoration Project to implement innovative strategies to combat poaching. After noticing that lions in the park were failing to recover as quickly as herbivores, the park's scientists radio collared all of the park's cats. Rangers then concentrated their anti-snare efforts in the regions of the park most frequented by lions. Since the implementation of the program, the park's lion population has doubled from forty to more than eighty. Limited technical and financial resources in other parks would make this obvious solution difficult to implement elsewhere, however.

In the parks without comanagement agreements, by contrast, rangers tend to be less motivated and managers less innovative. A stakeholder in Limpopo told me that rangers make just \$200 per month and go on weeks-long patrols with just five tins of fish, five tins of chicken, five tins of tomatoes, and a bag of rice. Consequently, they often turn to poaching small game while on patrol to supplement their diet with fresh meat (Interview 11). Rangers also have access to less education. One stakeholder told me how a ranger encountering an endangered pangolin in the park brought it to a local chief so that he could use its scales to make medicine (Interview 24). When rangers encountered a pangolin in a market outside of Gorongosa, by contrast, they recognized the animals as endangered and immediately confiscated it from the poacher.³³ Many rangers in parks lacking comanagement agreements do not patrol, spending weeks sitting in ranger stations without venturing into the bush. Under a comanagement agreement, intervening organizations can incentivize those rangers to patrol or even fire them if they do not. Under a technical management agreement, organizations are more limited.

Intervention Length

The length and scope of a given intervention also inform its impact on a park. Longer, more focused interventions allow NGOs to better navigate the intricacies of government bureaucracy and to build deeper relationships with surrounding communities. The Gorongosa Restoration Project (GRP) has been operating under stable, involved leadership for the fourteen years since Greg Carr first set foot in Gorongosa. In the words of one conservationist with a long history in Mozambique, "Gorongosa has been successful... due to the fact that Greg Carr was persistent – the fact that he didn't give up... Gregg Carr loves the place and has spent a lot of time and money negotiating through the intricacies of the park's bureaucracies to make the place work" (Interview 1). Through Carr's commitment to Gorongosa, GRP has been able increase the stability and clarity of its relationships with surrounding communities. This dynamic conforms to Axelrod's theory of the evolution of cooperation, which states that repeated interactions between parties will increase understanding and lead to cooperation (Axelrod and Dion 1988). In Gorongosa, through repeated interactions between local communities and a relatively stable park management team, communities' perceptions of Gorongosa have begun to shift. Rather than

³³ See: <https://thesmallermajority.com/2014/10/14/mozambique-diary-rescuing-a-dragon/>

viewing the park as an American land-grab operation or a subversive attempt by Frelimo to increase its power in a Renamo stronghold, many local community members have come to see it as a government-operated national park, and as an asset to Mozambique. The long-term and stable nature of the GRP's commitment has caused community leaders to realize that are best off having a good relationship with the park management, because the GRP is clearly there to stay (Interview 32).

An academic that studies community conservation provided further evidence supporting Gorongosa's experience, telling me that in community-NGO relationships, changes in perceptions often emerge only after ten years, and that deep community engagement often takes up to twenty years to occur. In other words, deep community engagement requires a multi-generational commitment by an NGO to a conservation area (Interview 13). Thus, short-term projects, such as those generally undertaken by the major international conservation organizations, tend to have difficulty establishing deep ties with communities and relevant government officials. Their projects often crumble when their funding dries up, because they are unable to build capacity.

Previous interventions by the African Wildlife Foundation in Banhine and by the World Wildlife Fund in Quirimbas – a park in Mozambique's North – collapsed after the intervening organizations left, likely due to this dynamic. Because organizations like WWF are donor-driven and must constantly position themselves at the cutting edge of conservation to muster support from donors, they have difficulty financing long-term projects. Donor fatigue often forestalls the kind of long-term commitment that can drive a successful recovery, such as that of GRP in Gorongosa (Interviews 1, 32).

The work of the Peace Parks Foundation sits somewhere in between the short-term status of the interventions in Banhine and Quirimbas, and the long-term status of the intervention in Gorongosa. While PPF has operated in Mozambique continuously since 1999, no single individual has been operating in the country as long as Greg Carr, and its conservation apparatus employs far fewer people than that of the Gorongosa Restoration Project. And unlike GRP, PPF operates in multiple countries so the focus of its upper management is split. Thus, PPF lacks the singlemindedness of GRP and has consequently been less successful navigating government bureaucracy and community relations (Interviews 15, 17). It has not yet developed the deep connections with government officials and local community members that the GRP has. That may change, however, with the Peace Park Foundation's ongoing shift away from its role as a technical advisor in parks, and toward a more involved role as a co-manager in Zinave and as a potential future co-manager in MSR and Limpopo.

Management Priorities

Different priority-setting strategies undertaken by different NGOs likely also play a role in park recoveries, although there is no clear "correct" strategy. The Gorongosa Restoration Project initially prioritized law enforcement, by quickly expanding the park's ranger force and increasing patrols in and around the park before relocating animals and building tourism infrastructure (Gorongosa Restoration Project). GRP has translocated relatively few animals from other parks, preferring to let the park's initially small animal populations rebound naturally

under the benefit of strong law enforcement. The organization has since invested heavily in community relations initiatives. It has opened and funded schools and health clinics in the neighboring towns, taking thousands of locals on free safaris, and provided agricultural expertise to surrounding farmers. Poaching in the park is down, as evidenced by rebounding animal populations, although it is hard to ascertain whether that is a function of less poaching, of more effective law enforcement, or of both. Finally, Gorongosa has started to develop tourism infrastructure as a means of generating income, with its first luxury concession set to open in June 2018. This security-first approach has worked well for Gorongosa, although it is costly up-front, requiring significant investment without immediate tourism revenue.

The Peace Parks Foundation has taken a different tact, investing early and heavily in animal translocation programs. PPF has translocated or is in the process of translocating hundreds or thousands of animals in all three of the parks in which it operates: Limpopo, Zinave, and MSR. The goal of this strategy is to “jumpstart” tourism, so that tourism revenues can finance law enforcement operations (Interview 14). This strategy has not worked well in Limpopo, the park in which it has been implemented the longest, although that may be a function of Limpopo’s unique rhino-driven poaching epidemic. While the park receives about 15,000 tourists per year, they mostly just pass through from South Africa to reach the Mozambican coast (Interview 11). Poachers quickly killed most of the animals translocated to the park when PPF opened the fenced-in sanctuary into which they were initially released, a miscalculation which PPF has acknowledged while planning more recent translocations.

The translocation jumpstart strategy is just getting started in MSR and Zinave, although there are hopes that the lighter poaching intensity in those parks will allow the strategy to function better than it did in Limpopo (Interview 15, 26). PPF also hopes that more spectacular coastal and riverfront scenery of MSR and Zinave – compared to the dry Mopane scrub of Limpopo – will allow those parks to more easily retain tourists. Both parks still lack the deep community outreach programs and highly effective ranger force of Gorongosa, however. It is still too early to tell if jumpstarting those parks will be effective.

Resettlement Strategy

A unique approach to human resettlement is another area in which Limpopo differs from Mozambique’s other parks. Limpopo is the only protected area in the country that has adopted a formal resettlement program, financed by the World Bank. The program was intended to voluntarily move 2,000 households in seven villages in the park’s core to houses of equal or better standard outside the park, while providing agricultural expertise to provide the moved populations with irrigated farms. So far it has failed miserably. After ten years and tens of millions of dollars, the program has moved just 485 families, 27% of the total population in the park’s core (Interview 19). Conservationists have blamed the villagers’ hesitance to move on the presence of the minor poaching kingpins inside the park who profit off of rhino horn and ivory. One person familiar with the park suggested that a few traditional healers had hijacked the process by demanding ever more extravagant animal sacrifices – including elephant, zebra, and buffalo – to appease the spirits and fill the villagers’ bellies before moving (Interview 11). Other stakeholders have blamed the government, arguing that political will for the move does not exist because politicians are wary of losing votes (Interview 21). In the meantime, a new generation of

villagers in the park have begun to move out of their parents' homes and establish new houses, increasing the in-park population almost as quickly as the resettlement program has shrunk it (Interview 10). Thus, the massive sum of money spent on resettlement has contributed very little to the success of the park.

Management teams in Mozambique's other parks seem to have learned from the problems faced by Limpopo, preferring an informal enticement resettlement strategy to a formal strategy. While Mozambican law does not force people out of parks, it does prevent the development of infrastructure and of new buildings within their boundaries (Interviews 18, 33). Park management teams in Gorongosa and MSR have used this dynamic to their advantage, by funding development initiatives such as schools and agricultural programs outside the parks' boundaries. Life within the park, meanwhile, has grown more difficult as growing elephant and hippo populations have ravaged crops and threatened community members (Interview 15). While both parks retain substantial human populations within their bounds, they have begun to experience a slow exodus as people seek better lives outside the parks' borders (Interviews 15, 33). Moreover, they have achieved that exodus while generating goodwill through community development projects, rather than bad will through an active relocation project. Passive resettlement may just be more effective than active resettlement in a Mozambican legal context. That said, it remains to be seen whether the enticement strategy will function in the long-term, or whether in-park population growth rate will outpace park emigration rates.

Community Relations

The effect of community-park relationships on park outcomes is murky across Africa. The analyses of community conservation projects in Hulme and Murphree's book suggest that despite the prevailing narrative painting community conservation as a solution to Africa's conservation and development challenges, actual projects have met with only occasional and limited success (Hulme and Murphree 2001). The impacts of community-park relationships can be particularly difficult to understand, because relationships are a function of both context-based and intervention-based factors. Relationships tend to be driven by the strategies adopted by intervening organizations and/or by park management teams. Then again, every community is different, with a unique set of desires, and with a unique relationship to the land and resources enclosed within a protected area. In this section, I posit that the lack of tourism revenue in Mozambican parks means that parks are unable to provide meaningful conservation benefits to park-adjacent communities. This lack of benefits means that while community conservation projects in the country may change communities' perceptions of parks at the margins, they have failed to improve resource management, and have therefore had little impact on park outcomes.

The non-zero-sum nature of benefits to communities from conservation projects and benefits to communities from unsustainable resource use presents a fundamental challenge to community conservation initiatives. Gibson shows that many community members in Zambian parks benefit from park revenues and poaching simultaneously (Gibson 1999). I observed similar dynamics in Mozambican parks; almost every park I visited has some community outreach program, and almost every park I visited experiences poaching. Moreover, the benefit a community receives from a piece of land via community conservation projects must be valued against its opportunity

cost, namely the benefit a community would receive from the same land under cultivation (Interview 1).

Intra-community dynamics further complicate things, because benefits are generally not distributed evenly within communities. Benefits can incentivize some community-members to better manage natural resources, even while those left out continue to prioritize poaching (Gibson 1999). For a community conservation project to be successful, then, it must do two things. First, the project must benefit a community beyond the opportunity cost incurred when the community loses the right to cultivate the land. Second, the project must benefit as many members of a community as possible, so that forgotten sectors do not continue to poach.

Mozambique's low population density and its law requiring that communities receive 20% of park revenues, provides it the potential, albeit largely unrealized, to have successful community conservation programs. According to one conservationist familiar with projects across the region, population densities around most Mozambican parks are still low enough that park revenues could meaningfully benefit surrounding communities (Interview 14). Another conservationist contrasted the Mozambican situation with that of Kruger, explaining that because millions of people live adjacent to Kruger, income from the park will never be able to meaningfully benefit all of them, creating a dynamic of competition between the park and the communities surrounding it (Interview 13). The law allocating 20% of park revenues to local communities could further support community conservation initiatives, as it incentivizes communities to organize and create channels to receive money. While every person with whom I discussed community conservation agreed that 20% is not enough to meaningfully engage communities at present, the law at least creates a framework for higher levels of engagement in the future (Interviews 12, 13, 14).

Lack of revenue in the present, however, has thus far prevented successful community conservation projects from taking shape in Mozambique. Tourists do not visit game preserves without animals. The annihilation of Mozambique's wildlife during the civil war, then, means that the country's parks have not had the assets to attract the tourists capable of generating revenues. That leaves Mozambican community conservation programs facing a catch-22. Park management teams can only convince communities to stop poaching by providing them with revenues exceeding the opportunity cost of giving up poaching. But those kinds of revenues are only possible in parks in which poaching has slowed to the point that animal populations can recover and draw tourists. Thus, for a community conservation program in Mozambique to be successful, one of two things must happen. First, effective law enforcement, can depress poaching to a point that animal populations recover, attracting the tourists necessary to generate revenue. Alternatively, park management teams can fund development projects through external funding, thereby incentivizing community members to stop poaching without relying on meager park revenues to do so. Both of these strategies require exogenous sources of funding, either to support law enforcement efforts or fund development projects, before a park is capable of generating tourist revenue. Thus, in recovering post-conflict parks with depressed animal populations, community conservation projects seem doomed to failure unless they are backed by external financial support.

The experience of community conservation efforts in the parks I visited mostly support that dynamic. In many parks, management teams have adopted some community conservation programs, yet in almost every park, high levels of poaching persist. In Maputo Special Reserve, community conservation efforts include programs to develop honey and piri-piri farms, and to help communities secure sustainable water sources (Interview 16). Yet persistent poaching has kept the populated northern and eastern quarters of the park almost devoid of wildlife (Interview 15). In Limpopo, management has developed eighteen irrigation schemes to improve agricultural yields around the park, and has invested in developing sustainable fishing strategies in the adjacent reservoir (Interview 23). Moreover, the park has coordinated an expensive resettlement process and community members outside the park receive 20% of the park's revenues, valued at \$67,012 in 2014, the highest of any terrestrial park in Mozambique (Biofund). In the Tchuma Tchato Community Conservation Area, a suite of hunting concessions surrounding Mágoè National Park, communities receive part of the revenue from lucrative hunting safaris. A hunter familiar with Mozambique told me that this dynamic successfully depressed and maintained animal populations until about 2013, when the appointment of a new, corrupt warden undermined the program. Revenues fell and poaching skyrocketed. The reduced animal populations and funding from safaris means that hunters in the area have had difficulty restoring revenues, even though the corrupt warden has since been replaced by a fairly competent one (Interviews 28, 30). No real community outreach programs currently exist in Banhine, Zinave, or Marromeu.

Only in Gorongosa has meaningful investment in community relations been matched with significant growth in wildlife populations. Gorongosa has invested heavily in education in the surrounding communities. The Gorongosa Restoration Project helps fund and operates within 20 schools every day, and provides scholarships to fund higher education for girls in the communities (Interview 33). Gorongosa has also experienced growth in wildlife populations. However, I was unable to determine whether that growth is in part due to reduced poaching intensity in response changing valuation of the park by community members, or whether it is a function only of increasingly effective anti-poaching strategies. Rangers in the park still report relatively high levels of poacher arrests in the park, so if the community relations programs have helped to slow poaching, their effects have been marginal.

Thus, in a post-conflict country like Mozambique, community conservation programs have relatively little bearing on park outcomes. In parks without animals to drive tourist revenues, management teams are unable to provide communities sufficient benefits to change valuations of parkland and to change poachers' behaviors. Even well-financed community conservation programs in areas that retain game, such as Zimbabwe's CAMPFIRE program and Mozambique's Tchuma Tchato Community Conservation Area can collapse (Hulme and Murphree 2001; Interview 30). The likelihood of success in parks without game, then, is extremely low.

Policy Recommendations and Conclusions

So where does our analysis of Mozambican protected areas' recoveries leave us? After analyzing the state-based, context-based, intervention-based and community-based factors that have shaped

park outcomes, what advice can we provide to policymakers and conservationists looking to strengthen parks post-conflict in Mozambique and elsewhere? Unfortunately, there is no simple explanation clarifying why some parks have recovered while others have not. Instead, post-conflict conservation is messy and complicated. It contains many variables interacting with one another in unpredictable ways. Moreover, the same variables have sometimes affected different parks in different ways, due to the unique contexts of each Mozambican protected area. My analysis of protected area recoveries often left me with more questions than answers. Nevertheless, I have been able to draw forth a few lessons from my research in Mozambique, which I hope will be helpful to conservationists and policy-makers in the country and in post-conflict states more broadly.

Lesson 1: War creates different rules for post-conflict conservation

Because war devastates state institutions, post-conflict conservation areas cannot rely on the state using money and might to brute-force struggling parks toward success. Often times, the necessary money, management capacity, and law enforcement capacity simply does not exist. The state will not be able to create functioning parks, then, by applying a one-size-fits-all recovery plan to all of the post-conflict country's protected areas, especially if that plan is developed by international conservationists used to operating in the parks of peace-time countries.

Instead, policymakers should develop recovery plans for each park individually, paying special attention to the unique contextual factors that inform each parks' potential trajectories. In a post-conflict country, the responses to these contextual factors, rather than the allocation of meager state assets, will often make or break a park. It is imperative, then, that the policy-makers in charge of developing recovery plans spend time in the field. They should focus on learning from and communicating their plans to the park's key stakeholders, so that they develop a deep understanding of the intricacies of each park, a process impossible to undertake from an office in Maputo.

Lesson 2: Not all parks are created equal.

Because contextual factors play a major role in shaping park recoveries, different park contexts will make some more amenable to recovery than others. Factors like a park's location, its biological and aesthetic resources, and its human population density can all affect its threat level and recovery prospects. In a post-conflict country, with limited capacity and resources, governments often cannot sufficiently rebuild and support all protected areas. Before beginning reconstruction, then, governments should spend time and money evaluating the recovery prospects of the country's parks, so that they can invest resources in the parks with the greatest chance of success. Such a strategy in Mozambique would likely involve focusing tourism and law enforcement investment on Maputo Special Reserve and Limpopo, both parks with partially recovered animal populations and access to South African tourist markets (although the high level of poaching in Limpopo is a downside to investment there). This strategy might also involve focusing tourism investment in Marromeu, a park with plenty of animals but no tourism infrastructure to attract revenue-generating visitors.

This focused strategy can eventually help to support parks with lower recovery potential. The money from profitable parks can be used to support biologically-important parks incapable of generating revenue on their own, such as Banhine. This dynamic is common in other countries, such as in South Africa, where a few popular and profitable parks like Kruger and Table Mountain support the less visited parks in the system.

Lesson 3: Money speaks, but too often it does so inflexibly and intermittently

While money rarely hurts a park's recovery prospects, there are certain spending patterns that are far more effective than others at driving a park toward success. In particular, funding should be coordinated, so that it does not leave temporal or spatial gaps, as temporary funding shortages can set a park back months on the development curve (Interview 15). I often heard of parks with plenty of total funding unable to finance critical operations such as law enforcement, due to earmarking of money by international organizations. Creating a pool of money that can be used to fill key funding gaps, such as the fund that Biofund is now creating in Mozambique, could help speed park recoveries in post-conflict countries.

There are also certain areas in which spending is more effective than others. Investing in law enforcement capacity, especially in providing rangers competitive wages and merit-based bonuses, has been very successful in Gorongosa and in Zinave. Investing in resettlement in Limpopo, meanwhile, has used enormous amounts of money with very little progress. That money almost certainly would have been better spent elsewhere.

Lesson 4: Interventions should be long-term, lean and provided leeway

The lack of state capacity in post-conflict conservation systems means that international interventions are crucial in driving parks' successes. International NGOs can often provide the funding and capacity that the government cannot. However, not all interventions are created equal. Successful interventions build relationships and understanding over the course of many interactions with stakeholders, all of which takes time. Conservation organizations that operate in many countries often lack the focus to undertake this kind of successful long-term intervention. Donor-driven organizations must always be at the forefront of the newest trend in conservation, and therefore tend to lack the staying power to see a successful intervention through. The three-to-five year projects they tend to prioritize often dissolve immediately after the organization moves on to the next project.

When policymakers in post-conflict states choose international partners, then, they should prioritize lean organizations committed to long-term investment in just a few, or even a single, park. The government should then provide those organizations leeway, so that they have the autonomy to effect change without being forced to move jump over constant bureaucratic hurdles. Leeway does not mean no oversight; government should maintain the final say over major decisions, and should coordinate with the NGO to appoint mutually agreeable wardens. But on minor decisions, and especially on funding decisions, the government should step back. The interventions in Mozambique that have been the most successful, such as that undertaken by the Gorongosa Restoration Project, are also the ones that have the most authority over staff management and priority-setting decisions.

Lesson 5: Post-Conflict parks cannot survive off of community relations alone

There is a narrative in African conservation circles that community conservation is the key to continent's environmental woes. Proponents argue that divesting authority over protected areas to local communities gets community-members invested in resource management, so that biodiversity and local residents benefit simultaneously. In reality, however, community conservation has been very hit or miss. It has only really functioned in areas with very low population densities, such as the deserts of Namibia and Botswana, and around protected areas with very high revenues, such as hunting concession.

While Mozambique still has a relatively low population density, the devastation of its parks by the civil war means that Mozambican parks are unable to raise revenue without enormous initial investment in tourist infrastructure and in either law enforcement or animal translocations. This lack of revenue suggests that early investments in community conservation programs are doomed to failure in post-conflict parks, as parks without animals will not be able to provide sufficient revenues to offset the opportunity cost of the land.

This does not mean that community conservation will never work in a post-conflict country. Once parks have recovered to the point that they attract tourists again, they may well be able to generate enough revenue to create the win-win scenario outlined by advocates of community conservation. But recovery strategies that focus on community conservation, at the expense of investments in law enforcement and tourism infrastructure, are likely to fail. Thus, in post-conflict parks, policymakers should only prioritize community conservation programs once a park has gotten back on its feet, with a strong wildlife populations and a profitable revenue structure.

Conclusion

Conservation and conflict are intertwined. Degraded ecosystems drive war and war in turn degrades ecosystems. Yet despite the abundant evidence linking conflict and conservation, they are still almost always studied separately. Through this study, I hope to have made some small contribution to our understanding of the relationship between conflict and conservation. I hope, too, that the lessons I learned doing research in Mozambique can help support park recoveries there and elsewhere. I am confident that well-functioning protected areas can help break the cycle between conflict and ecosystem collapse. I have seen parks like Gorongosa and Maputo Special Reserve begin to transform broken war-torn landscapes into drivers of equitable growth and development. I am confident, too, that with the right toolkit these transformations can happen across Mozambique and Africa. I know that international organizations, when thoughtfully selected and managed by governments, can help weak post-conflict states rebuild conservation capacity and create the lasting relationships and education programs that parks need to function over the long-term. So, I hope future researchers will continue to investigate the relationship between conservation and conflict. I hope they will continue to hone that toolkit, so that intrepid conservationists and community members can create more sustainable and equitable post-conflict protected areas.

List of Anonymous Interviews

1. Interview with international conservationist. June 2017. Maputo (City), Mozambique.
2. Interview with fisherman. June 2017. Inhambane, Mozambique.
3. Interview with Mozambican conservationists. June 2017. Inhambane, Mozambique.
4. Interview with Mozambican biologist. June 2017. Inhambane, Mozambique.
5. Interview with International conservationist. June 2017. Inhambane, Mozambique.
6. Interview with three Mozambican conservationists. June 2017. Inhambane, Mozambique.
7. Interview with Mozambican law enforcement official. June 2017. Sofala, Mozambique.
8. Interview with international conservationist. June 2017. Sofala, Mozambique.
9. Interview with international conservationist. June 2017. Sofala, Mozambique.
10. Interview with Mozambican law enforcement official. June 2017. Gaza, Mozambique.
11. Interview with international conservationist. June 2017. Gaza, Mozambique.
12. Interview with Mozambican conservationist. June 2017. Maputo (City), Mozambique.
13. Interview with two South African conservationists. July 2017. Western Cape, South Africa.
14. Interview with South African conservationist. July 2017. Western Cape, South Africa.
15. Interview with international conservationist. July 2017. Maputo, Mozambique.
16. Interview with Mozambican law enforcement official. July 2017. Maputo, Mozambique.
17. Interview with Mozambican biologist. July 2017. Maputo, Mozambique.
18. Interview with Mozambican tourism official. July 2017. Maputo, Mozambique.
19. Interview with international conservationist. July 2017. Maputo (City), Mozambique.
20. Interview with former private sector hunting operator. July 2017. Maputo (City), Mozambique.
21. Interview with Mozambican government official, and former law enforcement official. July 2017. Maputo (City), Mozambique.
22. Interview with Mozambican professor, doing research in conservation. July 2017. Maputo (City), Mozambique.
23. Interview with international conservationist. July 2017. Gaza, Mozambique.
24. Interview with Mozambican law enforcement official. July 2017. Gaza, Mozambique.
25. Interview with international conservationist. July 2017. Inhambane, Mozambique.
26. Interview with former private sector hunting concession operator. July 2017. Inhambane, Mozambique.
27. Interview with Mozambican law enforcement official. July 2017. Inhambane, Mozambique.
28. Interview with Mozambican law enforcement official. August 2017. Tete, Mozambique.
29. Interview with Mozambican law enforcement official. August 2017. Tete, Mozambique.
30. Interview with private sector hunting operator. August 2017. Tete, Mozambique.
31. Interview with Mozambican conservationist. August 2017. Maputo (City), Mozambique.
32. Interview with international biologist. January 2017. Skype.
33. Interview with international conservationist. January 2017. Skype.
34. Follow-up interview with international conservationist (interview 1). Skype.
35. Follow-up interview with Mozambican conservationist (interview 12). Skype.

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